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ABSTRACT

This publication contains the Applied Mathematics Curriculum (Carpentry) for grades 11 and 12 for the Cincinnati (Ohio) Public Schools. The curriculum is part of a larger program (the Applied Academics Program), which emphasizes the integration of mathematics and the language arts with vocational content. Included in the document is a description of the Applied Academics Program (including its philosophy, goals, and evaluation policy), the Applied Mathematics Program (including its philosophy, goals, program objectives, and subject objectives) and the Applied Mathematics Curriculum for grades 11 and 12 (Carpentry I and II). The curriculum outlines include vocational student objectives and student activities and related academic student objectives and student activities. The appendices contain evaluation instruments and forms. (RH)

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# APPLIED ACADEMICS

# CARPENTRY

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# MATHEMATICS

1986

SE 048 599

BRANCH OF VOCATIONAL/
CONTINUING EDUCATION
DEPARTMENT OF STUDENT SERVICES
CINCINNATI PUBLIC SCHOOLS

CURRICULUM BULLETIN VE-36
COURSE OF STUDY



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## STATEMENT OF APPROVAL

Pursuant to all requirements of the Ohio State Department of Education, the course of study contained in this manual has been developed and approved by the Cincinnati Public Schools for use in:

Subject: Applied Mathematics I & II - Algebra I

Grade(s) 11 & 12

School: Cincinnati's Comprehensive High Schools

Board of Education Approval: February 25, 1980
September, 1985

# APPLIED MATHEMATICS

## CARPENTRY

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1984

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The VETIP project was completed under the coordination and supervision of Dennis P. Miller, Supervisor of Trade and Industry, under the direction of Vera M. Ramstetter, Associate Director of Vocational Education, and under the general direction of T.R. Herklotz, Director of Vocational/Continuing Education, and Willis Holloway, Assistant Superintendent.

1985-1986

The project now continues, broadened and expanded, under its new name, Applied Academics; and more specifically, Applied English and Applied Mathematics. For the additional writing and revision, we gratefully acknowledge Ronald Hartzel, Joseph Heink, Everett Newman, Albert Paddock, Kenneth Skirtz, Ronald Smith, Kathy Witherup, Donella Hess, Maridee Kessen, Ruth Robinson, Della Wiles, Nora Walton, Sue Raudabaugh, Theresa Penn, and Gary Lewis. The editing was done by Betty Ottesen.

# APPLIED ACADEMICS PROGRAM

## INTRODUCTION

### Background

During the 1983-84 school year, VETIP (Vocational Education Target Intervention Program) was piloted at Withrow High School in the carpentry and construction electricity classes. Three curricula - mathematics, language arts, and the vocational - were interrelated so that what the student learned in one was reinforced in the other two. Vocational students became used to receiving assignments to do written research projects from their vocational teacher. They carried models constructed in the vocational laboratory into their English class. Their mathematics teacher gave writing assignments.

The basic premises of this model program were as follows: - instruction in language arts and reading is more effective if it is related to vocational content and is given either immediately before or at the same time as that content is taught by the vocational teacher; evidence of personal interest and concern from the teacher affects students' academic achievement; students who are actively involved in learning are more successful in school; the coordinated effort of teachers, counselors, and administrators is necessary to effect changes in the learning environment that will enable a significant number of pupils to successfully complete their secondary education.

In 1984-85 VETIP was implemented by a team of teachers, a counselor, and administrators. Counselors optioned students from VETIP vocational classes into VETIP language arts classes. All of the students from one vocational class, except those who were in advanced placement English, constituted one language arts class. The class stayed together for four periods each day ( a three-hour vocational class plus one period of language arts).

Applied Academics Today

The project being implemented currently follows these same guidelines, though expanded to include mathematics as originally intended. Its name speaks its purpose and chief emphasis - applied academics.

The teaching team is primarliy comprised of the math teacher, the English teacher and the vocational teacher. Administrators and counselors are support persons in the main drama.

The central person on the team is the vocational teacher, and it is his/her responsibility to coordinate the activities of the team. Before each unit of instruction in the vocational class, this teacher gives to the academics teachers a Unit Communication Form (see Form B) which provides them with the information they need to give related instruction.

For each student, the vocational teacher keeps on file a folder containing the following information: class schedule, diagnostic test information (see Form C), Student Profile, if issued, (see Form A) and the Student Evaluation Sheet (see Form D).

At the end of each term, the teachers meet to assess the progress of each student and to complete the specified sections of the Student Evaluation Sheet. At other times, the teachers informally confer so that each one is constantly informed of individual student progress in both the affective and cognitive domains.

Classroom Atmosphere

One of the basic premises of this program is that the learning environment provided by the teacher greatly affects students' achievement. The teacher's general manner usually sets the tone for the class. A pleasant expression, neat appearance, and a command of authority let the student know that there is a job to do.

Effective use of authority is one of the most difficult concepts to master. The heavy-handed autocratic teacher might succeed in holding the forces in line, but the environment he/she provides is usually not one where students feel comfortable. At the other extreme is everyone's pal, the teacher who takes a peer approach to students. The environment provided by this teacher is usually so free that students do not sense any direction in their learning.

Somewhere between these two is the professional and caring teacher in the role of manager of a positive learning environment. Calmness, concern, firmness, and consistency are characteristics of this teacher. He/she starts each class promptly with a motivating activity. Mundane beginnings with such activities as roll call tell the student that the teacher is not terribly interested in or certain about what is going to occur in class.

From the beginning to the end of class, the effective teacher has a clear plan of the learning activities in which the students are to be engaged. Long lectures and question-answer discussions where the teacher asks the questions and three or four students provide all of the answers do not keep interest alive. Passive listeners soon get bored and listless.

This teacher also finds time to talk individually with students. He/she lets the student know that there is a cooperative effort among Applied Academics team members to help him/her succeed in school.

Frequent contacts are made with the student's parents. Home visits are recommended. As one way of exploiting the student's strengths, the teacher contacts the parents to congratulate them on something good that their child has done. Frequently, the only contact teachers have with parents concerns some negative aspects of the child's behavior.

Efficient management of the daily routine of any class sets a business-like atmosphere conducive to learning. Systems for checking out tools, using the restroom and going to lockers are developed so that each request does not call for a decision by the teacher. Consistency, fairness and a set pattern usually remove these kinds of activities from the realm of potential conflict and disruption.

Rotation of responsibilities among students is important in a vocational class. Each student needs ample opportunity to experience responsibility in a number of situations during the course of the year. For instance, this week's tool room supervisor may be next week's crew foreman.

Students quickly sense that the teacher is in control of the environment and sincerely cares about what happens to them. Even though poor behavior must be dealt with, the effective teacher focuses attention on students' acceptable behavior. Praise is given in a genuine manner. Students' strengths are used as the bases for learning.

The success of the Applied Academics Program is directly related to the environment provided by the teacher. The teacher must make the students feel that they are part of the class and that they can succeed in school.

Directions for Use of Course of Study

Part II of this course of study contains the curriculum for the vocations, English, and mathematics. These have been written during the summers of 1983, 1984, 1985 and 1986. They are subject to revision as the New Courses of Study for English and Mathematics are adopted and as users give further input. All curricula follow approved graded courses of study for the appropriate subject area.

One of the premises of the program is that mathematics and language arts instruction should be related to vocational content and given at about the same time as that content is taught. Therefore, there are columns for those teachers. In the English Activities column, suggetions for teaching vocabulary, both technical and non-technical, are given. The vocational teacher lists the words for the unit on the Unit Form and gives it to the English teacher.

Reading skills needed in comprehending the specified sections of the text are also listed in this column. These are the same reading skills taught in any class, but here they are taught using the vocational material as the context. Practice writing exercises are included at relevant points in the curriculum.

In the column titled Math Activities, areas of mathematics covered in the vocational unit are listed. The vocational teacher gives the mathematics teacher a more specific listing on the Unit Form. The instruction given by the mathematics teacher in basic computational skills is based on diagnostic test results. However, in teaching these basics, the mathematics teacher uses examples that are relevant to the content being studied in the vocational program. For instance, in learning to figure area, the student may determine how many twelve-inch square tiles are needed to cover a kitchen floor that is ten feet by twelve feet.

The English and mathematics teachers use this program to relate basic skill instruction to content instruction and to combine their teaching when possible. Reading graphs and working word problems are areas that call for reading and mathematical skills. The teachers may elect to team teach or in some other way supplement each other's work.

The forms included in this program are not intended to make the teacher's paperwork more cumbersome but to ease the transfer of information among teachers who are working toward a common goal -- students' success in their vocational program. Individual teachers may develop better methods of involving students in the learning process, more exciting motivating activities, more creative approaches to teaching the units. The daily lesson plans of two carpentry teachers using the program may differ in activities but should be similar in that they reflect the premises of this program and the coordination of effort among the support team.

Each teacher's effectiveness related to the vocational student is evaluated in terms of the student's achievements, attendance, number of discipline referrals, and overall adjustment to school. All people working on the team are responsible for the model's effectiveness.

## District Philosophy of the Cincinnati Public Schools

The purpose of the Cincinnati Public Schools shall be the perpetuation and improvement of the democratic way of life. To this end, the schools shall strive to develop in children the knowledge, skills, habits, understanding, attitudes, and character traits essential for rich personal living, for sound choice of and effective participation in a vocation, for noble and satisfying human relationships, and for responsible, contributing citizenship. Important among the outcomes to be achieved are staunch moral character and appreciation of spiritual values; love of home and country; respect for duly constituted authority; genuine concern and thoughtful consideration for the welfare and rights of others regardless of race or creed; willingness to act in the interest of the general welfare; disciplined approach to the varied responsibilities of life; and the desire ever to improve in those competencies essential to effective personal and social living.

Realizing fully the great responsibility of the schools of the community in the pursuit of these objectives and outcomes, the Board of Education believes they can be satisfactorily achieved only with the full cooperation and support of all agencies of community life that share responsibility for the welfare and development of children and youth. Among these, the responsibility of the home is primary. The development, therefore, of close relationships with these agencies, and in particular, a home-school partnership of responsibility and effort, is a principle aim of the schools.

The superintendent shall, from time to time, with the advice and consent of the Board of Education, prepare statements of specific objectives consistent herewith, and these statements shall serve as the basis for determining the curriculum and instructional practices of the schools and for evaluating their effectiveness.

APPLIED ACADEMICS

PROGRAM PHILOSOPHY

We believe that three curricula - mathematics, English and the vocational content - can be interrelated so that what the student learns in one class can be reinforced in the other two.

We believe in the following basic premises: instruction in communication skills and math is more effective if it is related to vocational content and is given either immediately before or at the same time as that content is taught by the vocational teacher; evidence of personal interest and concern from the teacher affects students' academic achievement; students who are actively involved in learning are more successful in school; the coordinated effort of teachers, counselors and administrators is necessary to effect changes in the learning environment that will enable a significant number of pupils to successfully complete their secondary education.

We believe that the learning environment provided by the teacher greatly affects students' achievement. The teacher's general manner usually sets the tone for the class. A pleasant expression, neat appearance, and a command of authority let the student know that there is a job to do. Effective use of authority is one of the most difficult concepts to master. A positive learning environment will be established through calmness, concern, firmness and consistency. Efficient management of the daily routine of any class sets a business-like atmosphere conducive to learning.

We believe that a team effort among the three teachers provides the students with coordinated/related instruction and a network of support which actively involves them in learning, thereby motivating the student to achieve. The team members meeting on a regular basis to interact, plan and implement the course of study/curriculum help create the desirable climate.

We believe that the most effective approach to teaching the vocational applied academic skills is an integrated one. This instructional approach is most effective when it is:

- built upon student experineces
- developed within the context of the language used by students
- used in real and life situations

APPLIED ACADEMICS

PROGRAM GOALS

I. The Vocational Applied Academics Program will provide lesson plans with the vocational content as the core of the integrated English and mathematics skills. Therefore, all skills will be taught with the vocational content as the basis.

II. The Vocational Applied Academics Program will provide continued opportunities to develop listening, speaking, observing, reading, composition, and writing skills.

III. The Vocational Applied Academics Program will provide continued opportunities to develop logical thought, sequencing, computational mathematics and theoretical mathematics skills.

IV. The Vocational Applied Academics Program will provide assessment of student progress in both the affective and cognitive domains.

## APPLIED ACADEMICS

## PUPIL EVALUATION POLICY

An evaluation of students' cognitive growth in the Vocational Applied Academics Program can be assessed through a variety of regular classroom procedures. The methods used should be ongoing, collective, progressive, relevant and valid. The Student Profile Form will be an ongoing "case study" collection instrument.

In the vocational area, student success can be measured through objectives written/oral tests, daily class participation, observation of completed tasks, checklists of duties or specific skills, and the actual performance of tasks required.

In the academic areas, student skill growth can be assessed through objective testing, spoken and written use of language, compositions, projects, daily classroom participation, speeches, panel discussions, reports, essay tests, and defining/explaining mathematical procedures or axioms.

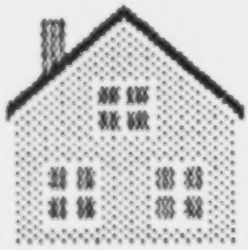
To meet districtwide testing requirements for the competency based education in reading, writing and mathematics, standardized tests, CIMS and writing samples will be used.

The evaluation of the students' affective growth will be assessed through attitude scales, quarterly evaluation by teachers, conference recording and group rating forms.

# APPLIED ACADEMICS

# MATHEMATICS

THE APPLIED MATHEMATICS OBJECTIVES AND ACTIVITIES FOR EACH VOCATIONAL CONTENT AREA ARE TO BE INTEGRATED INTO THE GRADED COURSE OF STUDY AND THE CURRICULUM BULLETINS ADOPTED BY THE CINCINNATI PUBLIC SCHOOLS.



## APPLIED ACADEMICS
## MATHEMATICS
## PROGRAM PHILOSOPHY

Mathematics is a growing body of information and a set of processes. It originates in the world of reality, is abstracted, and formalized into a logical system of facts, concepts, and rules. It is used to describe the quantitative and spatial aspects of the world, and as a tool in problem solving, scientific investigation, and technological development. All people use mathematics to some extent in their daily lives.

The Applied Academics Mathematics Program in the Cincinnati Public Schools is designed to enable all pupils to learn mathematics and achieve skill with its use in order to reach their full potential and to cope with the quantitative and spatial aspects of their environment.

Mathematics is to be taught so that pupil self-image is enhanced and good attitudes toward mathematics are developed. Instructional strategies and content are to be selected in accordance with knowledge of child development and learning theory. Manipulative materials, readiness activities, instructional aids, and realistic applications related to the vocational content are used. Ideally, mathematics will be viewed by the learner as a meaningful activity having many applications and not merely as a mental discipline. All areas of mathematics are more easily grasped when they are applied to practical daily and vocational applications in problem solving.

The goals in this program include more than computation. Daily use of such skills as estimating, problem solving, interpreting data, organizing, measuring, and especially applying mathematics to vocational situations is essential if students are to master the basic mathematical competencies needed for daily living and on the job.

## APPLIED ACADEMICS

## MATHEMATICS

## PROGRAM GOALS

The goals of the Applied Academics-Mathematics Program of the Cincinnati Public Schools are to provide each student with the opportunity to master the following skills, as related to an identified vocational area.

I. The Applied Academic Mathematics Program will provide continued opportunities to apply the four basic mathematical operations.

II. The Applied Academic Mathematics Program will provide continued opportunities to apply skills in reading, interpreting and constructing charts, graphs, tables, handbooks, and reports.

III. The Applied Academics Mathematics Program will provide continued opportunities to apply mathematical concepts and operations.

IV. The Applied Academics Mathematics Program will provide continued opportunities to apply measuring skills.

V. The Applied Academics Mathematics Program will provide continued opportunities to apply skills in calculators and computers.

VI. The Applied Academics Mathematics Program will provide continued opportunities to apply mathematics skills to solve consumer problems.

## APPLIED ACADEMICS

## MATHEMATICS

## PROGRAM OBJECTIVES

I. Basic Operations

A. The program provides opportunities to develop skills in whole numbers

B. The program provides opportunities to develop skills in decimals

C. The program provides opportunities to develop skills in percent

D. The program provides opportunities to develop skills in fractions

II. Reading, Interpreting, and Constructing

A. The program provides opportunities to read, interpret and construct charts

B. The program provides opportunities to read, interpret and construct graphs

C. The program provides opportunities to read, interpret and construct tables

D. The program provides opportunites to read, interpret and construct handbooks

E. The program provides opportunities to read, interpret and develop reports

III. Mathematics, Concepts and Operations

A. The program provides opportunities to solve relevant problems

B. The program provides opportunities to check reasonableness of solution

C. The program provides opportunities to interpret results

IV. Measuring Skills

A. The program provides opportunities to use measuring skills related to metric units

B. The program provides opportunities to use measuring skills related to English units

V. Computer and Calculator Skills

A. The program provides opportunities to develop skills related to computer usage

B. The program provides opportunities to use calculators for problem solving and to verify solutions

VI. Consumer Problems

A. The program provides opportunities to calculate income

B. The program provides opportunities to understand banking procedures

C. The program provides opportunities to identify consumer credit

# APPLIED MATHEMATICS

## SUBJECT OBJECTIVES

A. Whole numbers, decimals, fractions, and percents

The student will:

1. add, subtract, multiply, and divide whole numbers, decimals, and fractions
2. round numbers and estimate computational results
3. reduce fractions
4. change: fractions to decimals, decimals to fractions, percents to fractions, decimals to percents, percents to decimals
5. determine: the percentage of a number, the percent one number is of another, the percent of increase or decrease
6. compare two numbers as ratios
7. use ratios to express rates
8. solve direct and indirect proportions
9. perform the basic operations with denominate numbers

B. Charts, graphs, tables, handbooks, and reports

The student will:

1. read and interpret graphs, tables, charts, handbooks, and reports
2. collect and organize data
3. order numbers according to size
4. construct tables, graphs, charts, and reports
5. determine mean, mode, median, and range for a given set of data

C. Concepts, operations, checks, and interpretations

The student will:

1. use appropriate mathematical vocabulary

2. interpret and construct two-dimensional scale drawings
3. identify basic geometric shapes and figures, their parts and properties
4. use and solve basic geometric formulas
5. use coordinate systems to determine locations
6. construct basic geometric figures
7. identify the sides of a right triangle
8. use the relationships of the sides of right triangles to find missing parts
9. classify lines by position: intersecting, parallel, perpendicular
10. evaluate formulas
11. solve equations
12. solve problems individually and as a member of a group

D. Measuring skills to obtain data necessary to solve relevant problems

The student will:

1. identify the metric units of measure
2. express metric equivalent linear units, liquid units, mass (weight) units and volume units
3. find surface area using metric units
4. find volume using metric units
5. identify English units of measure
6. express English equivalent linear units of measure, liquid units, weight units, and volume units
7. find surface area using English units
8. find volume using English units
9. add, subtract, multiply and divide English units
10. add, subtract, multiply and divide metric units

11. express English and metric equivalent linear units, liquid units, weight units, and volume units

12. select and use appropriate instruments to make linear, liquid, weight, and volume measurements

13. identify the degree of precision of a measurement

14. select and use appropriate instruments to measure time and temperature

15. calculate measures appropriate to the identified vocational area

16. use specific instruments and units appropriate to the identified vocational area

17. determine the area and circumference of a circle

18. determine the volume of rectangular solids, and cylinders

19. measure angles

E. Calculators and computers

The student will:

1. use a calculator for time consuming calculations and to verify solutions

2. use computer programs appropriate to the identified vocational area for problem solving, record keeping, report preparation and graph construction

F. Consumer Skills

The student will:

1. calculate income, given rate and time, or piece or commission rate

2. use banking skills related to checks, check registers, deposit slips, and savings accounts

3. reconcile bank statements

4. calculate interest

5. identify different types of consumer credit and state the purpose for each

6. use skills to purchase and operate vehicles and compare to cost of alternative transportation
7. use maps
8. compute costs of home ownership
9. compute costs of alternatives to home ownership
10. compute federal, state, and local income taxes
11. compute premiums for various types of insurance
12. compare various types of related insurance
13. develop a personal budget
14. use skills for comparative shopping

# APPLIED ACADEMICS

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# 11TH GRADE CURRICULUM

The following instructional activities are divided by grade level and are intended to assist you in teaching the objectives in the graded course of study. As supplements to the activities, instructional information is given in the introduction, philosophy and goals sections at the beginning.

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| **ORIENTATION, CLASS AND SAFETY RULES**<br>**Time Allotment: Days 1 - 5**<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| identify and correctly interpret class rules and regulations. | - read and discuss the school rules, class rules. | -read and discuss the school rules, class rules. | identify and correctly interpret class rules and regulations. |
| exhibit an understanding of school rules. | - fill out all required forms for the class. | -practice fire and weather emergency drills. | exhibit an understanding of school rules. |
| become familiar with the building structure for fire drill and weather emergency situations. | - read safety rules and take all pertinent forms home for parental signature. | -discuss the correlation between the mathematics class and the carpentry class. | become familiar with the building structure for fire drill and weather emergency situations. |
| score 85% or higher on a written exam covering class rules and regulations. | - practice fire and weather emergency drills. | -discuss classroom procedures, course requirements, grading, exam requirements and general expectations of the class. | demonstrate an understanding of the overall objectives of the course. |
| | - start a student notebook. | | demonstrate an understanding of classroom procedure and expectations. |
| | - take exam. | | demonstrate an understanding of mathematics as applied to salaries and wages. |
| | - discuss respect, behavior, attitude, responsibility, as it applies to an individual and as it applies to a group. | | |
| | Note: Academic and Vocational teachers will coordinate activities. | | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| CONCRETE<br>Time Allotment: Days 6 - 12 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| layout and establish forms.<br><br>know the ingredients and proportions to pour and finish concrete and the safety factors involved.<br><br>identify the tools needed.<br><br>set up a form to a blue print.<br><br>perform level, grade and contour.<br><br>be familiar with the characteristics of concrete<br><br>inplace concrete and the problems involved.<br><br>finish concrete<br><br>clean up tools and job site. | -become familiar with blueprint, measurement and scale.<br>-take measurement test.<br>-set up a transit to shoot grade.<br>-learn the ways to come to level.<br>-know about squaring up and leveling.<br>-become familiar with safety hazards of tools and job site.<br>-take safety, level and layout tests.<br>-build forms, footing, foundations.<br>-perform flatwork, steps, special applications.<br>-re-enforce concrete<br>-take test on forms.<br>-be able to take safety test for concrete and forming<br>-learn about placing the concrete equipment used<br>-learn about finishing concrete.<br>-learn about estimating material<br>-take test on placing concrete and estimating<br>-attend VICA Meetings<br>Note: Students will complete the objectives of vocational applied mathematics. | -make a scale drawing of the classroom.<br>-make scale drawings of various construction projects.<br>-read actual construction drawings or blueprints to identify or interpret specific dimensions as requested.<br>-use actual construction drawings or blueprints to estimate quantities of specific materials needed to complete the project.<br>-measure the lengths of several pieces of lumber to the nearest foot, nearest inch, nearest ½ inch, nearest ¼ inch, nearest 1/8 inch, and nearest 1/16 inch.<br><br>-discuss the uses of the obtained results.<br><br>Note: Academic and Vocational teachers will coordinate activities. | read and interpret scale drawings and blueprints.<br><br>construct scale drawings.<br><br>check blueprints for compliance with building codes.<br><br>identify and use the rules for calculations with approximate numbers.<br><br>interpret a drawing or blueprint and make an estimate of the quantity of various materials needed to complete the project.<br><br>define the precision and accuracy of a measurement. |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| STUCCO<br>Time Allotment: Days 13 - 15<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| become familiar with the materials involved and the usage of stucco.<br>mix and apply the material to wall.<br>know how stucco is tooled on and finished.<br>know how to estimate materials.<br>know the safety factors involved which must be practiced at all times.<br>analyze information on tools, estimating and safety.<br>calculate mortar, the mix and proportions.<br>prepare the surface and set up<br>apply the scratchcoat.<br>apply the finish coat<br>apply texture or finish surface<br>erect scaffold. | -select the tools used.<br>-know the layout and the use and purpose of stucco.<br>-analyze the properties of stucco.<br>-determine materials used, and the proportions.<br>-learn how it is applied and where.<br>-complete the texture and finish test on process, estimating and safety precautions.<br>-estimate materials necessary.<br>-discuss safety considerations.<br><br>Note: Students will complete the objectives of vocational applied mathematics. | -relate ratio to the tools in a toolbox or on a bench. (what is the ratio of pliers to screwdrivers? what is the ratio of pliers to total number of tools?)<br>-estimate the quantities of materials needed to mix a specified quantity of stucco using the proper proportions.<br>(Film: Ratio and Proportion - Geometry (#1783)<br><br>Note: Academic and vocational teachers will coordinate activities. | write the ratio of two quantities.<br>use cross products to determine whether two ratios form a proportion.<br>use cross products to solve proportions.<br>understand that zero cannot be the denominator of a fraction or ratio. |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| STONE<br>Time Allotment: Days 16 - 18<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| become familiar with the characteristics of stone, its usage, the difference in cut stone and rough stone and facing stone.<br>understand the laying of stone the mortar used.<br>understand the application of stone in residential and commercial buildings.<br>follow proper safety precautions.<br>assimilate information, layout tools and safety.<br>study stone characteristics, cutting and facing.<br>prepare motar used.<br>lay to a line.<br>finish the wall (tooling out). | -study and learn tools names, usage and safety considerations.<br>-become familiar with stone usage and applications, mortar used.<br>-be able to layout, cut stone, face stone, lay stone.<br>-line and finish stone.<br>-take test on tools, layout, stone usage, mortar and safety.<br>-discuss safety considerations.<br>-evaluate opportunities in stone work.<br><br>Note: Students will complete the objectives of vocational applied mathematics. | -observe teacher demonstration converting the rotational rate of a specific diameter circular saw into a tangential velocity expressed in miles per hour.<br>-complete the following activity under the mathematics teacher's supervision:<br>use a construction drawing or blueprint to estimate the quantity of stone needed for a specific application (wall, sidewalk, steps, etc.)<br><br>Note: Academic and vocational teachers will coordinate activities. | demonstrate an understanding of the reasons for safety rules when working with stone products. |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| **BRICK**<br>Time Allotment: Days 19 - 30<br>Given the proper instruction, the student should be able to:<br>become familiar with the materials and tools used in the brick trade.<br>layout and construct a wall to specifications.<br>estimate materials.<br>become familiar with what it takes to be a brick layer, union and non-union.<br>be knowledgeable about residential and commercial work, and the safety hazards involved.<br>process information on layout, tools, estimation and safety.<br>mix mortar proportions understanding how it is made.<br>process for spreading mortar on 2 x 4.<br>process for laying brick demonstrations.<br>set up wall.<br>process to build lead demonstration.<br>(cont.) | Students will:<br>-study tools, layout and safety.<br>-determine brick characteristics and sizes.<br>-develop mortar types and characteristics.<br>-determine proportions and observe if it has mixed.<br>-set up work stations to practice.<br>-layout bond on 2 x 4.<br>-set up work stations, brick lead and wall.<br>-cover steps to build a brick lead.<br>-test brick into steps to lead.<br>-observe safety precautions.<br>-review steps to a lead to show other types of leads and layout for bond and height.<br>-process to lay to align difference in bond.<br>(cont.) | Students will:<br>-use wooden bars to define complex numbers.<br>-use wooden bars to illustrate the four operations with complex numbers.<br>-work various addition, subtraction, multiplication and division problems pertinent to the construction trades.<br>-work various percent problems pertinent to the construction trades.<br>-complete the following activity under the mathematic teacher's supervision:<br>use a construction drawing or blueprint to estimate the number of bricks needed for a specific application (wall, sidewalk, fireplace, etc.).<br>(Films: Language of Mathematics (1852)<br>Donald in Mathmagic Land (499)<br>Note: Academic and vocational teachers will coordinate activities. | Given the proper instruction, the student should be able to:<br>define complex numbers.<br>define the factorial of a natural number and recognize that the factorial of 0 is 1.<br>add two or more complex numbers.<br>find the difference between two complex numbers.<br>find the product of two complex numbers.<br>find the quotient of two complex numbers.<br>find a percent of a number. |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Brick (cont.) | | | |
| Given the proper instruction, the student should be able to: | Students will: | | |
| process to lay brick to a line demonstration. | -process to cut a brick by hand tool and power tool (observe safety). | | |
| process to cut brick demonstration. | -finish wall, rub down, wash clean. | | |
| understand different kinds of bonds. | -be aware of safety needed. | | |
| understand story pole and coming to height. | -study different brick walls and applications. | | |
| process to tool out and finish demonstration. | -study residential, commercial brick requirements. | | |
| understand application of brick. | -know about different kinds of scaffolding. | | |
| work with scaffolding. | -become familiar with setting up and safety. | | |
| | -take test on brick masonry and safety. | | |
| | -attend VICA meetings. | | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| **BLOCK**<br>**Time Allotment: Days 31 - 42**<br>Given the proper instruction, the student should be able to:<br>become familiar with the materials and tools used in the laying of block.<br>construct a block wall and estimate materials needed.<br>become familiar with the usage of blocks.<br>know what it takes to be a block layer and the safety hazards involved.<br>learn information about blocks lay out tools, estimating and safety.<br>discuss mortar, what it is and how it is made.<br>process for spreading mortar.<br>set up for a wall.<br>lay block.<br>build a lead.<br>lay block to a line.<br>cut a block to size.<br>make a story pole.<br>finish the wall, tool out and clean or point up.<br>(cont.) | Students will:<br>-analyze tool layout and safety factors.<br>-know how blocks are made, their characteristics and sizes.<br>-mix mortar types and know characteristics of same.<br>-determine proportions of materials and know how they are mixed.<br>-set up work stations to practice spreading mortar.<br>-understand layout of bond, different types of bond.<br>-set up work stations for block lead and wall.<br>-take steps to build a block lead.<br>-test block and steps to a block lead.<br>-attend VICA meetings.<br>-review test and steps to a lead, other kinds of leads, layout for bond and height.<br>(cont.) | Students will:<br>-measure various pieces of lumber to the nearest 1/16".<br>-measure various blocks, bricks, etc. to the nearest 1/16".<br>-measure the classroom, length and width, to the nearest foot and nearest inch.<br>-measure various items in the classroom, desks, tables, etc. to a specified accuracy.<br>-measure various angles (on paper) using a protractor.<br>-construct various angles (on paper) using a protractor.<br>-measure the "angles" present in various pieces of irregular cut lumber.<br>-measure specified angles as shown on construction drawings or blueprints.<br>-complete the following activity under the supervision of the teacher:<br>use a construction drawing or blueprint to estimate the number of concrete blocks needed for a specific application. (foundation, wall, etc.) (cont.) | Given the proper instruction, the student should be able to:<br>demonstrate a basic understanding of linear measurement.<br>read a rule to 1/16".<br>demonstrate a basic understanding of angular measurement.<br>measure angles to the nearest degree using a protractor.<br>construct angles using a protractor. |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Block (cont.) | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | |
| set up scaffold and stocking. | -process to lay block to a line-holding bond, different kinds of bond.<br>-cut a block to size by hand tool and power tool.<br>-learn safety factors involved.<br>-finish wall, rub down, wash or clean.<br>-review safety factors involved.<br>-learn about different block walls, application of decorative or bearing finished.<br>-connect scaffolding.<br>-practice setting up different types.<br>-review safety factors.<br>-take test on block masonry and safety. | -use a construction drawing or blueprint of a small structure (garage, shed, etc.) to extimate the number of concrete blocks required to build it.<br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| LAYOUT OF STRUCTURE<br>Time Allotment: Days 42-45 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction; the student should be able to |
| set up a building level and/or building transit.<br><br>locate footing and building lines for a structure.<br><br>locate height and level lines for structure.<br><br>set up building level or transit.<br><br>locate stakes for batter boards.<br><br>shoot grade on stakes.<br><br>level batter boards.<br><br>lay out lines on batter boards.<br><br>square up building lines. | -learn level techniques and instruments used<br><br>-plot plan, lot and local codes.<br><br>-learn lay out procedures for footing foundations, grade, level and contour characteristics.<br><br>-learn to square up building lines, geometric figures.<br><br>-take test on layout, squaring up and leveling.<br><br>Note: Students will complete the objectives of vocational applied mathematics. | -discuss early need for mathematics, specifying a quantity, counting, measurement, etc.<br><br>-discuss mathematics required for "construction" in ancient times.<br><br>-be exposed to an introduction to mathematical requirements needed for a successful career in the construction trades.<br><br>-complete the following activity under the supervision of the teacher:<br><br>use a construction blueprint for the discussion and interpretation of footing, building, height and level lines.<br><br>(Film: In Search of Pyramid Secrets (#3794)<br><br>Note: Academic and vocational teachers will coordinate activities. | demonstrate an understanding of the development of mathematics through the ages.<br><br>understand the mathematical requirements related to a career in the construction trades. |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| FLOOR FRAMING<br>Time Allotment: Days 46 - 60<br>Given the proper instruction, the student should be able to:<br>take a floor plan and/or an assignment sheet and frame the floor system of a platform style house.<br>frame a balloon-style floor system to two stories according to the specifications.<br>build and install posts, girders, floor trusses and bridging.<br>identify the materials and tools needed for the job.<br>follow exactly the print dimensions.<br>cut sill boards and joist headers.<br>cut joists to specifications.<br>drill sills for anchor bolts.<br>assemble all floor system parts<br>attach 1st floor joists to studs.<br>attach 2nd floor joists to studs on ribbons.<br>(cont.) | Students will:<br>-organize job tools and materials.<br>-attach 1st floor joists to studs.<br>-build a 4-layer girder and post.<br>-follow the specifications on the print.<br>-install ribbons for 2nd floor joists.<br>-build a floor truss.<br>-cut sill boards, headers and joists.<br>-install 2nd floor joists.<br>-calculate spans and materials for the job.<br>-drill sills for anchor bolts.<br>-install joist hangers.<br>-install bridging.<br>-assemble all floor system parts.<br>(cont.) | Students will:<br>-calculate the areas of various four-sided figures cut from lumber.<br>-calculate the areas of larger four-sided figures as shown on construction blueprints.<br>-identify and describe various geometric solids by using a geometric solids demonstration kit.<br>-identify and describe the uses and applications of these solids in construction.<br>-calculate the volume of various cylinders or spheres (or parts thereof) shown on blueprints.<br>(Films: Discovering Solids: Solids in the World Around Us (#310)<br>Discovering Solids: Volumes of Cubes, Prisms and Cylinders (#2294)<br>Note: Academic and vocational teachers will coordinate activities. | Given the proper instruction, the student should be able to:<br>define and explain the difference between rectangles, squares, parallelegrams and trapezoids.<br>calculate the area of any of these figures when given the required dimensions.<br>identify cubes, rectanglar prisms, pyramids, cylinders, cones and spheres.<br>determine the volume of rectangular solids.<br>calculate the volume of cylinders and spheres. |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Floor Framing (cont.) | | | |
| Given the proper instruction, the student should be able to: | Students will: | | |
| install joist hangers. | -install fire-stopping. | | |
| install fire-stopping | -calculate the job expenses. | | |
| build a 4-layer girder and post | -take test. | | |
| build a floor truss. | -attend VICA meetings. | | |
| calculate spans and materials needed to do the job | | | |
| install bridging. | | | |
| calculate the job expenses. | | | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| SUB-FLOORING<br>Time Allotment: Days 61 - 70<br>Given the proper instruction, the student should be able to:<br>install tongue and groove plywood subflooring to floor system.<br>shiplap flooring boards at a 45° angle to joists.<br>install T & G hardwood flooring<br>install flooring perpendicular to joists.<br>determine that two pieces meeting must split the joists on which they meet.<br>observe nailing pattern.<br>determine costs of materials.<br>place boards and nail.<br>familiarize self with end joint connecting.<br>estimate materials and costs.<br>clean floor and put down building paper.<br>install parallel to long side of room.<br>learn nailing methods used.<br>familiarize self with T & G piece as a tool.<br>(cont.) | Students will:<br>-glue and nail perpendicular to joists.<br>-cut shiplap boards.<br>-prepare floor for building paper.<br>-nail 8 Ds 10" on joists and 6" on edge.<br>-nail down and attach end laps<br>-install parallel to long wall and nail down.<br>-learn about variations on floor openings and calculate costs.<br>-figure amount and cost of materials.<br>-install sleeper joists on concrete.<br>-take test<br>-attend VICA meetings. | Students will:<br>-calculate the number of board feet in each of several pieces of lumber of various lengths, widths and thicknesses.<br>-calculate the total number of board feet in one or more "stacks" of lumber.<br>-measure the radius, diameter and circumference of various circular cutouts.<br>-calculate the "area" of these same cutouts.<br>-calculate the diameter of a circle.<br>-calculate the radius of a circle.<br>-calculate the circumference of a circle.<br>-calculate the area of a circle.<br>-identify and measure the radius and/or diameter of various circles as shown on construction drawings, then calculate the circumference and area of that circle.<br>(cont.) | Given the proper instruction, the student should be able to<br>demonstrate an understanding of the concept of board feet.<br>calculate the number of board feet in a specific piece or stack of lumber.<br>demonstrate an understanding of the radius, diameter, circumference and area of a circle.<br>correlate circular nomenclature with the nomenclature of fasteners (the "penny," gauge, etc.) |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Sub-Flooring (cont.)<br><br>Given the proper instruction, the student should be able to:<br><br>install sleeper joists on concrete floors. | Note: Students will complete the objectives of vocational applied mathematics. | Students will:<br><br>(Film "Dynamics of the Circle" (#314)<br>-complete the following activity under the supervision of the teacher:<br><br>use a construction drawing or blueprint to estimate the amount of sub-flooring material required for a specific application (living room, bedroom, first floor, etc.)<br><br>Note: Academic and vocational teachers will corrdinate activities. | |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| WALL FRAMING<br>Time Allotment: Days 71 - 85<br>Given the proper instruction, the student should be able to:<br>lay out, cut install plates and studs for walls according to blueprints or assignment sheets.<br>build corners, wall partitions, window, door headers and trimmer units.<br>raise the walls, plumb and secure by bracing.<br>erect the outside walls, plumb and brace to floor.<br>attach and plumb interior walls<br>attach double top plates to lock walls.<br>install sheathing and insulation.<br>install drywall and paneling.<br>evaluate blueprints for job.<br>mark 2 x 4 plates 16" o.c. and prepare.<br>cut studs, trimmers, cripples.<br>install studs.<br>determine expenses of the job.<br>(cont.) | Students will:<br>-analyze blueprints for the job.<br>-cut corner studs, spacers and trimmers.<br>-erect outside walls, plumb and brace to floor.<br>-mark plates for studs, openings, etc.<br>-build 3 types of corners.<br>-attach and plumb interior walls.<br>-cut studs, trimmers and cripples.<br>-pre-cut and assemble headers.<br>-attach double top plates to lock wall.<br>-install studs.<br>-pre-build door R.O. Frames.<br>-install insulation and sheathing.<br>-determine expenses of the job.<br>-install pre-fab window units.<br>(cont.) | Students will:<br>-identify the legs and the hypotenuse using right triangles cut from lumber.<br>-identify the legs and hypotenuse of the above triangular sections using a construction drawing showing triangular sections.<br>(Film: Possibly So Pythagoras) (#631)<br>-solve" various right triangles i.e. measure any two sides, then calculate the measure of the third side using right triangles of lumber.<br>-check by measuring.<br>-choose any two dimensions from a construction drawing of a triangular section.<br>-calculate the third dimension using the Pythagorean theorem.<br>-compare his/her answer with the dimension shown on the drawing.<br>(cont.) | Given the proper instruction, the student should be able to:<br>define a right triangle.<br>identify the parts (legs, hypotanuse) of a right triangle.<br>demonstrate an understanding of the theory and applications of the Pythagorean Theorem.<br>Compute the measure of the hypotanuse of a right triangle when given the measures of the legs.<br>compute the measure of a leg of a right triangle when given the measure of the hypotanuse and the other leg. |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Wall Framing (cont.) | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | |
| cut corner studs, spacers and trimmers. | -install drywall and paneling. | (Film: Pythagorean Theorem - Geometry (#1784) | |
| build 3 types of corners. | -take test. | | |
| become familiar with pre-fab headers. | -attend VICA Session. | Note: Academic and vocational teachers will coordinate activities. | |
| become familiar with pre-built door units. | | | |
| become familiar with pre-fab window units. | | | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| CEILING FRAMING | | | |
| Time Allotment: Days 86 - 90 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| calculate joist spans, and materials needed to accomplish the job economically. | -determine joist spans based on roof. | -use calculators to solve basic problems pertinent to the construction trades. | use a calculator for mathematical computation. |
| study roofing designs and requirements. | -lay out joists for hip and gable roofs. | -develop speed and accuracy on a calculator by using "Timed Drills." | |
| plan ceiling joist layout. | -cut ledgers and joists. | -solve "multi-step" problems by using a calculator and pushing keys in the proper sequence. | |
| install ceiling joists, ledgers blocking. | -calculate 20 lb. live load. | | |
| determine joist sizes based on spans and roof designs. | -install stub joists. | -read and interpret various tables to obtain statistical information. | understand the use of tables to obtain, compile or interpret statistical or technical information. |
| calculate joists to accomodate a 20 lb. - live load. | -install joists perpendicular and parallel to walls. | -read and interpret various tables to obtain technical information needed for construction applications. | |
| lay out ceiling joists for hip and gable roofs. | -prepare for EXAM, VICA session. | | |
| install stub joist systems. | | -read and interpret various graphs containing general information. | read and interpret bar graphs, circle graphs, and line graphs. |
| cut ledgers, joists. | | | |
| install blocking and joists parallel to bearing walls. | | -construct various graphs to show general information. | construct bar graphs, circle graphs and line graphs. |
| install joists perpendicular to bearing walls. | | -read and interpret various graphs containing information related to the construction trades. | |
| | | (cont.) | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Ceiling Framing (cont.) | | Students will: | |
| | | -construct various graphs to show information related to the construction trades. | |
| | | Films: Expanding Math Skills Wit a Mini-calculator<br>-Introduction (#3376)<br>-Classroom Management (3377)<br>-Problem Solving (3378) | |
| | | Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| ROOF FRAMING<br>Time Allotment: Days 91-110<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| learn all roof framing terms, parts, types, principles and layout calculations.<br>cut roof framing members to size.<br>install roof framing parts including hips, jacks, commons, cripple jacks collar beams, knee walls and trusses.<br>study roof types (shed, hip, gable, etc.)<br>identify the parts of a roof system.<br>analyze the parts of a rafter.<br>determine rafter material size from specifications.<br>lay out rafter with framing square.<br>determine run, span, pitch, rise from plans.<br>cut ridge plumb cut from line length.<br>cut tail cut from overhang specifications. | -cut bird mouth cuts.<br>-mark plates and ridge board.<br>-demonstrate knowledge of roof parts.<br>-cut ridge plumb cuts.<br>-cut tail cuts on rafters.<br>-install hips, valleys and jacks.<br>-calculate rafter material sizes needed.<br>-cut hip jack rafters.<br>-install gussets on trusses.<br>-use framing square to lay out rafters.<br>-build a knee wall.<br>-calculate rafter dimensions.<br>-cut cripple jacks.<br>-erect and install trusses.<br>-take test.<br>-attend VICA session. | -measure various angles on paper using a protractor.<br>-construct various angles on paper using a protractor.<br>-measure the "angles" present in various peices of irregularly cut lumber.<br>-measure angles as shown on various construction drawings or blueprints.<br>-make a simple construction drawing involving specified angles.<br>-make a table of squares from 1 - 12.<br>-make a table of square roots of perfect square numbers from 1 - 144.<br>-discuss use of exponents in construction.<br>-locate integers (positive and negative) on a number line.<br>-locate mixed numbers (positive and negative) on a number line.<br>-locate irrational numbers (positive and negative) on a number line. | demonstrate a basic understanding of angular measurement.<br>measure angles to the nearest degree using a protractor.<br>construct angles using a protractor.<br>demonstrate the meaning of exponents.<br>use a table to find squares and square roots. (verify with calculator)<br>identify the numbers that are perfect squares, 1 - 144 and state their square roots.<br>raise a number to a power when the exponent is a whole number (with/without calculator).<br>use the numberline to identify and order integers.<br>distinguish between rational and irrational numbers. |
| (cont.) | | (cont.) | (cont.) |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Roof Framing (cont.)<br><br>Given the proper instruction, the student should be able to:<br><br>cut hip jack rafters.<br>cut valley jack rafters.<br>cut cripple jack rafters.<br>mark plates and ridge boards.<br>nail common rafters first.<br>install hips, valley and jack rafters.<br>install gussets on lab-made trusses.<br>build a knee wall to support long rafter spans.<br>erect and install trusses. | | Students will:<br><br>-use a number line to add signed numbers.<br>-use a number line to subtract signed numbers.<br>-develop, learn and apply the rule for adding signed numbers.<br>-learn and apply the rule for subtracting signed numbers.<br>-learn and apply the rule for multiplying signed numbers.<br>-learn and apply the rule for dividing signed numbers.<br>-perform mixed and combination operations with signed numbers.<br>-work various problems, pertinent to construction using signed numbers.<br>-relate the number line to linear measure and the use of a carpenter's rule.<br>(Films: Number Line - Whole Numbers (#7434)<br>Number Line - Fractions (7435<br>Big Numbers: Little Numbers (309)<br>Powers of Ten (3626)<br><br>(cont.) | Given the proper instruction, the student should be able to<br><br>add signed numbers.<br>subtract signed numbers.<br>multiply signed numbers.<br>divide signed numbers. |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Roof Framing (cont.) | | Students will: | |
| | | Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| DECKING THE ROOF | | | |
| Time Allotment: Days 111-115 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| install sheathing plywood to roof frame members. | -lay out plywood and spacer clips. | -work various multi-step problems related to the construction trades. | |
| cut plywood for hip, valley and ridge intersections. | -cut plywood to proper size and angles. | -complete the following activity under the supervision of the teacher: | solve simple multi-step problems using addition, subtraction, multiplication, and division in the proper sequence. |
| calculate material amounts, expenses. | -calculate materials. | use construction drawings or blueprints to estimate the amount of sheathing plywood required to deck a roof. | |
| perform shiplap roofing. | -nail plywood to rafters. | | |
| lay out plywood and nail up. | -place plywood in proper position. | | |
| place proper space between plywood sheets. | -take quiz on roof decking. | | |
| install plywood spacer clips. | | Note: Academic and vocational teachers will coordinate activities. | |
| calculate and lay out angles. | | | |
| cut plywood to size. | | | |
| place plywood in position. | | | |
| determine area and amount of roofing materials needed. | | | |
| cut shiplap to size. | Note: Students will complete the objectives of vocational applied mathematics. | | |
| install shiplap roofing. | | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| SHINGLE ROOFING<br>Time Allotment: Days 116-125<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| perform all roofing operations prior to placing shingles.<br>apply shingles.<br>install vents, skylights, exhaust fans.<br>calculate the roof area.<br>install building paper.<br>install flashing, vents, drip.<br>install roll roofing.<br>snap chalk lines to begin.<br>nail shingles down.<br>cut shingles to fit edges, valleys, etc.<br>apply shake (wood) shingles.<br>cut holes for skylights.<br>flash over vents, etc.<br>secure exhaust vents. | -determine area of roof.<br>-chalk lines for shingles.<br>-cut skylight openings.<br>-apply building paper and/or roll roofing.<br>-nail down shingles (asphalt and/or wood).<br>-flash vents, valleys, etc.<br>-install drip edge, flashing.<br>-cut shingles to size.<br>-install exhaust vents.<br>-take test<br>-attend VICA session. | -identify and name triangles cut from lumber.<br>-identify and name triangles as shown on construction drawings and blueprints.<br>-calculate the area of various triangles cut from lumber.<br>-calculate the area of various triangles as shown on construction drawings or blueprints.<br>-calculate the area of a hip roof by adding the areas of its rectangular and triangular sections.<br>-show that certain "pairs" of triangular sections in a hip roof could be "pieced together" to form rectangles.<br>-develop a short cut method for finding the area of a hip roof.<br>-identify the point using an ordered pair of numbers when given a point in the coordinate system.<br>-locate plot and properly label the point in the coordinate system when given the description of a point (ordered pair). | define triangles.<br>identify acute, right, obtuse, scalene, isosceles and equilateral triangles.<br>calculate the area of a triangle when given the required dimensions.<br>(cont.) |

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OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Shingle Roofing (cont.) | | Students will: | |
| | | -identify various points by quadrant location. | identify quadrants, origin and axes. |
| | | -relate the coordinate system to graph paper constructions as required in carpentry and the construction trades. | identify an ordered pair of intergers for a point on a grid. |
| | | -complete the following under the supervision of the teacher: | identify the quadrant location for an ordered pair of numbers. |
| | | use construction drawings or blueprints to estimate the quantity of shingles required to cover a roof. | plot a point on a grid when given an ordered paid of numbers. |
| | | Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| EXTERIOR TRIM<br>Time Allotment: Days 126-135<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| install windows, doors and trim.<br>perform cornice operations.<br>apply exterior siding materials.<br>install windows in R.O.<br>place and fasten doors in outside walls.<br>trim windows and doors as needed.<br>cut soffit and install.<br>cut fascia and install.<br>install gutters.<br>cut and install wood siding.<br>install vinyl and aluminum siding.<br>apply stucco or brick finish. | -install windows.<br>cut and place soffits.<br>-install wood siding.<br>-fasten doors and frames in outside wall.<br>-cut fascia and install.<br>-install vinyl or aluminum siding.<br>-trim windows and doors as needed.<br>-install gutters.<br>-apply stucco or brick.<br>-take EXAM.<br>-attend VICA sessions. | -apply formula to solve problems pertinent to the construction trades.<br>-practice substituting numbers for variables and simplifying the resulting expression.<br>-discuss the similarity of "substitution" in algebraic expressions to the use of "formula."<br>-practice translating word phrases into algebraic expressions.<br>-translate word phrases pertinent to construction into algebraic expressions or formula using correct abbreviations or symbols.<br>-learn, apply and practice the addition axiom to solve equations.<br>-learn, apply and practice the subtraction axiom to solve equations.<br>(cont.) | substitute numbers for variables.<br>use formula to solve problems<br>substitute numbers for variables and simplify the resulting expression.<br>write mathematical expressions for simple word phrases using addition, subtraction, multiplication and division.<br>solve addition or subtraction equations involving one operation.<br>solve multiplication or division equations involving one operation.<br>(cont.) |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Exterior Trim (Cont.) | | Students will:<br>-learn, apply and practice the multiplication axiom to solve equations.<br>-learn, apply and practice the division axiom to solve equations.<br>-apply two or more axioms to solve complex equations.<br>-apply equation solving techniques to problems pertinent to the construction trades.<br>Films: Algebra: An Introduction (#312)<br>Formulas In Mathematics (#2366)<br>Language of Algebra (#2322)<br>Sentences and Solution Sets (#2299)<br>Solving Equations (#6134)<br>Note: Academic and vocational teachers will coordinate activities. | solve complex equations involving two or more operations. |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| JOB SITE WORK<br><br>Time Allotment: 135-180<br><br>Job site dictates work to be done. The tasks required (modules) will be reviewed as needed on the job.<br><br>Given the proper instruction, the student should be able to:<br><br>estimate, layout and perform what is necessary to accomplish the job, using the proper materials and tools.<br><br>estimate and evaluate job.<br><br>lay out and identify job (task).<br><br>review task (module) to be performed.<br><br>follow-up task and skills<br><br>finish job-site work.<br><br>bill and evaluate job accomplished. | Note:<br><br>Time-slotted activities are related to the progress of the job. There will be a certain amount of time needed to size up the job and review whatever (module) task that is needed to perform, and to accomplish the job.<br><br>The related classroom activity will be controlled by scheduling and weather. During this time, the job will be evaluated, safety procedures tested, estimating and student involvement will be evaluated.<br><br>VICA meetings will be held.<br><br>An examination will be prepared which covers the work performed for the quarter. | Students will:<br><br>-construct a perpendicular to a line using a compass.<br><br>-note use of "perpendicular lines" on various construction drawings or blueprints.<br><br>-co-ordinate with vocational teacher.<br><br>-identify and describe various geometric solids by using a geometric solids demonstration kit.<br><br>-identify and describe the uses and applications of these solids in construction.<br><br>-calculate the volume of various rectangular solids shown on construction blueprints.<br><br>-calculate the volume of various cylinders or spheres (or parts thereof) shown on construction blueprints.<br><br>-calculate the probability (odds) associated with "games of chance." (e.g. probabilities of certain numbers "coming up" when throwing a pair of dice).<br><br>(Cont.) | Given the proper instruction, the student should be able to:<br><br>define intersecting lines.<br><br>define parallel lines.<br><br>define perpendicular lines.<br><br>construct perpendicular lines.<br><br>identify cubes, rectangular prisms, pyramids, cylinders, cores and spheres.<br><br>determine the volume of rectangular solids.<br><br>calculate the volume of cylinders and spheres.<br><br>understand the theory of probability and be able to calculate the probability that a specific outcome will result. |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont. - pg. 2) | | Students will: | |
| | | -note the number of times each tool is used on a specific job. | |
| | | -use this information to determine the "probability" of using that tool on future jobs of a similar nature. | |
| | | -keep track of the time required to do various construction jobs. | |
| | | -determine the "average" amount of time required to complete a job. | demonstrate an understanding of the term "mean." |
| | | | determine the mean after having been given a set of numbers. |
| | | -find the "median" of the set of numbers after having been given a "set" of numbers pertinent to construction. | demonstrate an understanding of the term "median." |
| | | | determine the median after having been given a set of numbers. |
| | | -note the number of times each tool is used on a specific job. | demonstrate an understanding of the term "mode." |
| | | -list these numbers in order, then determine the "mode" of that set of numbers (if any). | determine the mode after having been given a set of numbers. |
| | | -use the set of numbers compiled above to construct a frequency table. | demonstrate an understanding of the term "frequency." |
| | | (cont.) | (cont.) |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont. - pg. 3) | | Students will: | Given the proper instruction, the student should be able to: |
| | | | determine the frequency of a specified occurrence after having been given the required information. |
| | | -use frequency table, previously made, to illustrate measure of statistics. (e.g. just because a certain tool is used with a frequency of 2% it cannot be eliminated from the tool box.) | illustrate some uses of statistics. |
| | | | state some misuses of statistics. |
| | | -define sequence and give examples. | identify a sequence when given the first term and a rule for computing each successive term from the preceding term. |
| | | | find a specified term of an arithmetic sequence when two terms or one term and the common difference are given. |
| | | -define series, and give examples. | demonstrate an understanding of an arithmetic series. |
| | | -present a mathematical series, have the students determine the pattern or rule and determine the next term. | determine the next term in that series when given a valid arithmetic series. |
| | | -define "direct and inverse variation," and give examples. (cont.) | define and use direct and inverse variation. (cont.) |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont. pg. 4) | | Students will: | Given the proper instruction, the student should be able to: |
| | | -work problems using conversion factors pertinent to the construction trades. | identify and use conversion factors in meaningful situations. |
| | | -discuss the use of "systems" in problems pertinent to the construction trades. | solve problems by translating stated relationships into a system and interpreting the answer in a meaningful manner. |
| | | -discuss which strategies will be useful in construction situations. | look for a pattern.<br>construct a table.<br>consider possibilities systematically.<br>make a model.<br>guess and check.<br>work backwards.<br>make a drawing, figure, or graph.<br>select appropriate notation.<br>re-state the problem.<br>identify a subgoal.<br>solve a simpler problem.<br>change point of view.<br>check for hidden assumptions.<br>use a resource.<br>generalize. |



(cont.)

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont. pg 5) | | Students will: | Given the proper instruction, the student should be able to: |
| | | | check the solution. |
| | | | study the solution process. |
| | | -work various word problems pertinent to the construction trades. | read the problems carefully. |
| | | | identify information given and information sought. |
| | | | identify relevant information, discard irrelevant information. |
| | | | verbalize the problem. |
| | | | estimate the answer. |
| | | | find the exact answer. |
| | | | check answers. |
| | | -discuss initial use of and need for computers. | demonstrate an understanding of the historical development of computers. |
| | | -visit the computer lab. | |
| | | -identify and discuss uses of computers in various fields. | demonstrate understanding of the widespread applications and implications of computers in today's society. |
| | | -identify and discuss uses of computers in the construction trades. | |
| | | -discuss "jobs" that computers are capable/incapable of performing. (Use construction situations). | identify some of the limitations and disadvantages as well as the many advantages of computer usage. |
| | | -describe possible "computer errors" and innocent "victims." | identify the components of a computer and their functions. |
| | | (cont.) | |

APPLIED MATHEMATICS: CARPENTRY I

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont. Pg. 6) | | Students will:<br>-list known misuses of computers (swindling, invasion of privacy, selling of mailing lists, etc.).<br>-discuss cost versus savings.<br>-discuss advantages/disadvantages of computer usage.<br>-schedule time in the computer lab for basic hands-on instruction.<br>-bring a computer into the classroom for hands-on instruction.<br>-describe the five parts of a computer and their functions.<br>(Films: The Dot and the Line (#904)<br>Discovering Solids: Solids in the World Around Us (#310)<br>Mean, Median and Mode (#915)<br>Patterns in Mathematics (#2279)<br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

# APPLIED ACADEMICS

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# 12TH GRADE CURRICULUM

The following instructional activities are divided by grade level and are intended to assist you in teaching the objectives in the graded course of study. As supplements to the activities, instructional information is given in the introduction, philosophy and goals sections at the beginning.

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| JOB-SITE WORK<br><br>Time Allotment: Days 1 - 45<br><br>Note:<br><br>The job site dictates what work is to be done. The tasks (modules) required will be reviewed as needed on the job. The student will be able to estimate, layout and perform what work is necessary to accomplish the job, using the materials and the proper tools.<br><br>Given the proper instruction, the student should be able to:<br><br>estimate and evaluate the job.<br><br>layout and identify the job (task) to be accomplished.<br><br>review task (module) to be performed.<br><br>do the work with follow-up on the task (module) and skills.<br><br>finish up job site.<br><br>bill and evaluate job accomplished.<br><br>be aware of job opportunities from skills developed at job site. | Note:<br><br>The outside job will be in a time slotted activities which are related to procedures to the progress of the job. There will be a certain amount of time needed to size up the job selected and review whatever (module) task that is needed to accomplish the job. Most of this will be done on the job.<br><br>The related classroom activity will be controlled by scheduling and weather. During this time, the job will be evaluated. Safety procedures, testing, estimating and student involvement will be evaluated. Individual commitment to job, job responsibility and the student decision in considering his future will be discussed. VICA meeting will also be held. An examination covering the work for the quarter will be given.<br><br>(cont.) | Students will:<br><br>-use wooden bars to define complex numbers.<br><br>-use wooden bars to illustrate the four operations with complex numbers.<br><br>-work various addition, subtraction, multiplication and division problems pertinent to the construction trades.<br><br>-work various percent problems pertinent to the construction trades.<br><br>-measure specified angles on construction drawings or blueprints.<br><br>-make a simple construction drawing involving the use of specified angles.<br><br>-measure various pieces of lumber to the nearest 1/16".<br><br>-measure various blocks, bricks, etc. to the nearest 1/16".<br><br>-measure the classroom (length and width) to the nearest foot and nearest inch.<br><br>(cont.) | Given the proper instructions, the student should be able to:<br><br>define complex numbers.<br><br>define the factorial of a natural number and recognize that the factorial of 0 is 1.<br><br>add two or more complex numbers.<br><br>find the difference between two complex numbers.<br><br>find the product of two complex numbers.<br><br>find the quotient of two complex numbers.<br><br>find a percent of a number.<br><br>demonstrate a basic understanding of linear measurement.<br><br>read a rule to 1/16".<br><br>(cont.) |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job-Site Work (cont.) | Students will: | Students will: | Given the proper instructions, the student should be able to: |
| | -review class rules, school rules, off-campus rules and organization of class. | -measure various items in the classroom (desks, tables, etc) to a specified accuracy. | |
| | -review safety factors of job site and tool usage. | -measure various angles (on paper) using a protractor. | |
| | -go over outside work and the job selected to best benefit class. | -construct various angles, (on paper) using a protractor. | demonstrate a basic understanding of angular measurement. |
| | -review layout and estimating procedures | -measure the "angles" present in various pieces of irregularly cut lumber. | measure angles to the nearest degree using a protractor. |
| | -test on safety, estimating, and rules for on the job. | -measure specified angles on construction drawings or blueprints. | construct angles using a protractor. |
| | | -make a simple construction drawing involving the use of specified angles. | |
| | | -make a scale drawing of the classroom. | |
| | | -make scale drawings of various construction projects. | |
| | | -read actual construction drawings or blueprints to identify specific dimensions as requested. | read and interpret scale drawings and blueprints. |
| | | | construct scale drawings. |
| | | -use actual construction drawings or blueprints to estimate quantities of specific materials needed to complete the project. (cont.) | check blueprints for compliance with building codes. |
| | | | identify and use the rules for calculations with approximate numbers. (cont.) |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Job Site Work (cont.) | | Students will: | Given the proper instructions, the student should be able to: |
| | | | interpret a drawing or blueprint and make an estimate of the quantity of various materials needed to complete the project (or portions thereof). |
| | | -measure the lengths of several pieces of lumber to the nearest foot, nearest inch, nearest ½ inch, nearest ¼ inch, nearest 1/8 inch, and nearest 1/16 inch. | |
| | | -discuss the uses of the obtained results. | define the precision and accuracy of a measurement. |
| | | -calculate the number of board feet in each of several pieces of lumber of various lengths, widths and thicknesses. | demonstrate an understanding of the concept of board feet. |
| | | -calculate the total number of board feet in one or more "stacks" of lumber. | calculate the number of board feet in a specific piece or stack of lumber. |
| | | Films: Language of Mathematics (#1852)<br>Donald in Mathmagic Land (#499) | |
| | | Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| WALL BUILDING<br>Time Allotment: Days 45 - 60<br>Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| install non-bearing interior walls.<br>brace ceiling joints while removing a bearing wall.<br>build wood and metal stud walls for alteration and/or addition<br>custom build wall to fit opening.<br>secure wall on all sides.<br>secure ceiling with temporary beams on both sides of wall.<br>remove existing wall.<br>replace wall with a beam.<br>use metal channels and studs to build a wall.<br>build a stud wall addition. | -build wall to fit opening.<br>-secure ceiling with braces.<br>-use metal studs for wall.<br>-nail wall to existing walls.<br>-remove wall and set beam in position. | -use situational activity to compute gross wages when given the hourly rate and number of hours (regular and overtime) worked.<br>-use construction situation and rates.<br>-use situational activity to compute net wages when given the gross wages and total deductions.<br>-use construction situation.<br>-fill out a W-4 form.<br>-interpret a W-2 form.<br>Film: Wages and Production (#3641)<br>-complete the following activity under the supervision of the teacher:<br>estimate the quantities of materials needed to complete the job using a construction drawing pertinent to building or replacing a wall.<br>(cont.) | compute gross pay by using hourly and overtime rates.<br>find gross pay computed on a piece rate basis.<br>multiply decimals.<br>find the amount withheld from gross pay for federal, state and local taxes.<br>find the amount withheld for social security.<br>find the total amount of deductions and compute net pay. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Wall Building (cont.) | | Students will:<br><br>estimate the cost of the job using a current building supply catalog or price list.<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

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APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| ELECTRICAL<br><br>Time Allotment: Days 51 - 55<br><br>Given the proper instruction, the student should be able to:<br><br>install lights, fixtures and switches.<br><br>connect wires in junction boxes.<br><br>fish lines through walls, floors conduit.<br><br>install underground cable.<br><br>install light fixtures.<br><br>install switches (2 and 3-way).<br><br>install junction boxes.<br><br>make wire connections in boxes.<br><br>fish lines to desired location.<br><br>install underground cable.<br><br>Note: | Students will:<br><br>-install light fixtures.<br><br>-install junction boxes.<br><br>-fish lines to desired location.<br><br>-install 2 and 3-way switches.<br><br>-wire connection in boxes.<br><br>-take test.<br><br>-attend VICA session.<br><br>Students will complete the objectives of vocational applied mathematics. | Students will:<br><br>-compare costs of various kinds of checking accounts.<br><br>-fill out a deposit slip correctly.<br><br>-fill out a check correctly.<br><br>-write various checks to construction vendors.<br><br>-fill out a check stub correctly<br><br>-endorse a check correctly.<br><br>-fill out a check register using checks written to construction trade vendors.<br><br>-complete the following activity under the supervision of the teacher:<br><br>using a construction drawing or blueprint, estimate the amount of electrical conduit required for the job.<br><br>estimate the cost of the electrical conduit using a current builder's supply catalog.<br><br>**Note: Academic and vocational teachers will coordinate activities** | Given the proper instruction, the student should be able to:<br><br>complete a deposit slip for a checking account.<br><br>endorse a check correctly.<br><br>find the fees charged for cashing checks.<br><br>write the amount of a check in words.<br><br>complete a deposit slip.<br><br>complete a check stub.<br><br>fill in a check.<br><br>make entries of checks and deposits on a check register.<br><br>find the new balance in a checking account after each entry. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| PLUMBING<br><br>Time Allotment: Days 56 - 60<br><br>Given the proper instruction, the student should be able to:<br><br>perform drainage plumbing and supply side plumbing operations<br><br>repair and replace plumbing parts.<br><br>install sinks.<br><br>replace toilets.<br><br>repair drainage parts.<br><br>sweat solder copper lines.<br><br>glue PVC lines together.<br><br>replace traps.<br><br>install new faucets. | Students will:<br><br>-install sinks and toilets.<br><br>-sweat solder copper lines.<br><br>-replace traps.<br><br>-repair drainage system.<br><br>-install new faucets. | Students will:<br><br>-reconcile bank statement and check register balances when given the required information.<br><br>-calculate the interest on a savings account using compound interest tables.<br><br>-discuss savings plans offered by local savings institutions.<br><br>-work various interest formula problems.<br><br>-work various problems pertinent to the construction trades in which the net price must be found when given the list price and either a single or multiple trade discount.<br><br>-calculate the amount of discount and final net cost if a supplier offers an additional discount for paying the bill promptly (e.g. an additional 5% discount if the bill is paid within 10 days).<br><br>(cont.) | Given the proper instruction, the student should be able to:<br><br>reconcile a bank statement with a check register.<br><br>compute interest on a savings account using different intervals for compounding interest.<br><br>compare and contrast interest rates and services offered by local savings institutions.<br><br>use the interest formula $I + P = RT$.<br><br>demonstrate an understanding of list price, trade discount and net price.<br><br>calculate the net price when given the list price and the trade discount(s) (single or multiple). |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Plumbing (cont.) | | Students will:<br><br>-complete the following activity under the supervision of the teacher:<br><br>estimate the quantities of plumbing materials needed for the job while using a construction drawing or blueprint.<br><br>estimate the cost of these materials by using a current builder's supply catalog.<br><br>Films: Handling Checks (#3414)<br>How Banks Serve (#2649)<br>How to Use Your Bank (@2646)<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| DUCTWORK | | | |
| Time Allotment: Days 61 - 65 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| learn to connect ductwork. | -install duct in new room. | -fill out a promissory note to purchase construction supplies. | compute the interest and total amount due on a promissory note. |
| install different styles of ductwork. | -cut and install round ductwork. | -calculate the interest and total amount due on a promisory note. | |
| build an in-the-wall ductwork system. | -install firestop to direct air flow. | -fill out a credit card application. | fill out a credit card application. |
| install ductwork in new room. | -connect new and old ductwork together. | -determine charges on credit card accounts. | compute finance charges |
| connect old and new ductwork together. | -attach rectangular ductwork. | -verify a credit card statement. | |
| cut and install round ductwork. | -install wall vent. | -discuss and compare charge accounts offered by local department stores and others. | compare varying credit card plans. |
| install rectangular ductwork. | -take test. | -complete the following activity under the supervision of the teacher: estimate the amount of ductwork required for the job by using a construction drawing or blueprint. | compute interest and new balance after payments. |
| install firestop to direct airflow of duct. | -attend VICA session. | -estimate the cost of these materials using a current builder's supply catalog or price list. | compare various charge account plans. |
| install vent in wall. | | (cont.) | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Ductwork (cont.) | | Students will:<br><br>Films: Just Sign Here (#2528)<br>A Credit Card Boquet (#3180)<br>Handling Credit Cards (#3416)<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| DOORS AND WINDOWS<br><br>Time Allotment: Days 66 - 70 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| install a window.<br>hang a door.<br>install door locks.<br>remove and install a window unit.<br>replace a broken window glass.<br>remove and/or hang a door in its place.<br>trim out with casing.<br>cut hinge slots.<br>install cylinder locks. | -remove and install a window unit.<br>-hang a door (or replace one).<br>-cut hinge slots.<br>-replace broken window glass.<br>-trim a door frame with casing.<br>-install cylinder locks. | -discuss advantages of installment buying.<br>-calculate the finance charge for an installment plan purchase.<br>-discuss and compare interest rates and repayment plans offered by local lending institutions.<br>-complete the following activity under the supervision of the teacher:<br>determine the type, size and quantity of the various windows and doors required for a job using a construction blueprint.<br>make a cost estimate for all windows and doors required to complete the job by using a current builder's supply catalog.<br>Note: Academic and vocational teachers will coordinate activities. | compute finance charges.<br>compute monthly installments.<br>compare varying installment plans.<br>compare interest rates and repayment plans offered by various lending institutions. |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| DRYWALL | | | |
| Time Allotment: Days 71 - 75 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| estimate materials. | -determine materials needed. | -plan a trip using a road map to determine route and distance. | find the distance along a route and the travel time required using a map. |
| cut and install drywall. | -cover valiant screws. | -discuss and use a road map legend. | |
| type seams and finish coat drywall. | -cover drywalls and curves. | -find the distance between various cities by using a distance chart. | find the distance along a route using a distance chart. |
| calculate area to be covered. | -determine materials expenses. | -calculate the total cost of a trip by automobile, air and/or by train. | calculate total expenses for a trip when traveling by automobile. |
| determine amount of drywall needed. | -nail and screw drywall up to studs. | -discuss the advantages and disadvantages of each method of travel considering factors other than cost. | compare the cost of traveling by automobile to alternative methods of travel. |
| figure the cost of the materials. | -tape joints and skim coat. | -discuss recent developments in mass transportation. | |
| utilize cutting methods. | -take test. | -calculate the rental cost of various types of cars by using rate information from local agencies. | determine the cost of renting a car. |
| nail and screw drywall to ceilings, walls, etc. | -attend VICA session. | -calculate the rental cost of a truck which might be required for certain carpentry jobs. | |
| apply drywall to a curved surface. | | -complete the following activity under the supervision of the teacher. | |
| cover nails, screws and blemishes with joint compound. | | | |
| tape joints. | | | |
| skim coat. | | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Drywall (cont.) | | Students will:<br>-estimate the amount of drywall needed for the job by using a construction drawing or blueprint.<br>-estimate the cost of the drywall by using a current builder's supply list.<br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| PAINTING<br><br>Time Allotment: Days 76-80<br><br>Given the proper instruction, the student should be able to:<br><br>prepare surface for application techniques, clean up, and recoating procedures.<br><br>prepare walls by sanding smooth.<br><br>sand woodwork before painting.<br><br>mask off critical areas.<br><br>use proper brush techniques.<br><br>learn proper roller usage for coverage and looks.<br><br>correct rust spots.<br><br>clean paint can rim.<br><br>use proper thinner and clean up for oil, latex, etc. | Students will:<br><br>-sand walls and woodwork for painting.<br><br>-seal rust spots and brush properly.<br><br>-clean paint can rim.<br><br>-mask off critical areas.<br><br>-use proper roller methods (dry to wet, etc.)<br><br>-learn proper clean up methods and materials. | Students will:<br><br>-select a used car to buy from a newspaper ad.<br><br>-calculate the total cost of that car including State tax, registration and licensing fees.<br><br>-discuss buying a light truck which could be used in construction applications, both as an addition or alternative to buying a passenger car.<br><br>-fill out an order form for a new car.<br><br>-choose a new car to buy.<br><br>-calculate a "reasonable offer" for that car based on the sticker price.<br><br>-take a field trip to a local car dealership.<br><br>-calculate the deffered payment price and the finance charge for a car loan figuring the amount to be financed.<br><br>(cont.) | Given the proper instruction, the student should be able to<br><br>compute the total cost of buying a car.<br><br>find the sales tax.<br><br>compare and analyze used car ads.<br><br>compute the sticker price of a new car.<br><br>complete a car order form.<br><br>compute a reasonable price for a new car.<br><br>calculate the net price from different dealers.<br><br>explain what costs make up the total cost of car ownership.<br><br>compare the net prices and determine the best buy.<br><br>compute the deferred payment price of a car.<br><br>compute the finance charge. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Painting (cont.) | | Students will:<br>-complete the following activity under the supervision of the teacher:<br>-estimate the amount of paint needed for the job.<br>-using a current builder's supply catalog or price list estimate the cost of the paint.<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| CEILING WORK<br><br>Time Allotment: Days 81-85<br><br>Given the proper instruction, the student should be able to:<br><br>calculate the area and tvpe of materials to do the iob.<br><br>install furring or tees depending on ceiling type.<br><br>install ceiling tiles.<br><br>determine coverage needed.<br><br>select tvpe of tiles desired.<br><br>nail up furring strips.<br><br>install tees for suspended ceiling.<br><br>glue and/or strip tiles.<br><br>cut border tiles.<br><br>install suspended tiles. | Students will:<br><br>-calculate materials necessary.<br><br>-install furring strips.<br><br>-cut and install border tiles.<br><br>-pick tiles desired for a job.<br><br>-install tees.<br><br>-put in place suspended ceiling.<br><br>-take test.<br><br>-attend VICA session. | Students will:<br><br>-determine fuel consumption and cost per mile for a specific car.<br><br>-compare fuel consumption on the same car with and without air conditioning.<br><br>-compare fuel consumption using speed as a variable.<br><br>-calculate the trade-in value at the end of various numbers of years.<br><br>-read appropriate tables to calculate insurance premiums.<br><br>-invite a guest speaker to discuss automobile insurance.<br><br>-compare the cost of automobile ownership to the cost of alternate means of transportation.<br><br>-discuss leasing an automobile as an alternative to ownership.<br><br>-complete the following activity under the supervision of the teacher:<br><br>(cont.) | Given the proper instruction, the student should be able to<br><br>find a car's fuel consumption in miles per gallon.<br><br>find the cost of gas in cents per mile<br><br>compute the trade-in value.<br><br>find the amount of depreciation of a car.<br><br>explain the purpose of insurance.<br><br>compute the annual premium for automobile liability insurance.<br><br>describe the coverage provided by the following kinds of auto insurance: liability, medical. collision, comprehensive, uninsured motorist, and emergency road service.<br><br>compute the total cost of owning a car.<br><br>find the cost per mile traveled. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Ceiling Work (cont.) | | Students will:<br>-calculate the ceiling area of the various rooms.<br>-estimate the number of ceiling tiles needed for each room and the total required for the job.<br>-use a current builder's supply catalog and estimate the cost of the ceiling tiles.<br>Films: Insurance: What You Should Know (#3913)<br>Percentages: Insurance (#5610)<br>Record: Automobile Insurance (#7718<br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| PANELING<br><br>Time Allotment: Days 86-90 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to |
| measure area for materials needed. | -calculate area and materials needed. | -use newspaper ads to determine and compare costs of renting an apartment. | compute a reasonable amount to spend for rent. |
| install paneling. | -cut out for electrical boxes, etc. | -use the "rule of thumb" (one week gross pay - maximum amount to spend for one months rent), calculate the maximum rent that is affordable for persons with specified incomes. | fill out an application for a lease. |
| perform trim and finish work on paneling. | -apply paneling with adhesive. | | |
| measure and calculate area. | -cut and install corner and edge strips. | | |
| prepare walls with furring strips. | -take exam. | -complete the following activity under the supervision of the teacher: | compare advantages and disadvantages of living in the suburbs and living in the city. |
| drive panel nails to studs. | -attend VICA session. | -use a construction drawing or blueprint to calculate the area of the various surfaces to be paneled. | compare renting with home ownership. |
| install panels with panel adhesive. | | -estimate the number of sheets of paneling required to complete the job. | describe the insurance coverage available to renters. |
| install corner strips. | | -estimate the cost of the paneling using a current builder's supply catalog. | |
| make cut out for electrical boxes, switches, etc. | | Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| CABINET INSTALLATION<br><br>Time Allotment: Days 91-105<br><br>Given the proper instruction, the student should be able to:<br><br>assemble and install new cabinets, placing counter tops on base cabinets.<br><br>install hardware on cabinets.<br><br>make panels on doors.<br><br>build frames for mounting doors.<br><br>cut joints to make stiles and rails for panels (T&G, mortise and tenon, etc.).<br><br>secure base cabinets.<br><br>install wall hung units.<br><br>align with the walls.<br><br>mount the cabinets.<br><br>cut sink holes where necessary.<br><br>caulk where necessary.<br><br>notch for plumbing, etc.<br><br>drill and screw hinges.<br><br>drill and secure handles.<br><br>install kick strip at floor.<br><br>install drawer slides. | Students will:<br><br>-build door panels.<br><br>-align cabinets to walls.<br><br>-build a jig for hinges and hardware.<br><br>-make frame for doors and cabinets.<br><br>-mount counter top to cabinet.<br><br>-screw hinges on.<br><br>-cut joints for framework.<br><br>-cut out sink holes.<br><br>-drill for handles.<br><br>-fasten down base cabinets.<br><br>-caulk counter tops.<br><br>-install toe kick strips.<br><br>-hang wall units.<br><br>-notch panels and cabinets for plumbing.<br><br>-install drawer slides.<br><br>-take test.<br><br>-attend VICA session. | Students will:<br><br>-using the "rule of thumb" (2.5 times gross annual income - amount to pay for a house), and calculate the cost of a house which is affordable for persons with specified incomes.<br><br>-compare the cost of conventional FHA, and VA mortgage loans.<br><br>-discuss variable and fixed rate mortgages.<br><br>-discuss the need for home-owners insurance.<br><br>-calculate the premiums for various amounts and types of homeowners insurance.<br><br>-use a chart to calculate depreciation of personal property.<br><br>-discuss how "assessed valuation" is determined.<br><br>-calculate the cost of building a desired house.<br><br>-use newspaper ads to determine and compare costs of buying a home. | Given the proper instruction, the student should be able to<br><br>compute the cost of an affordable home.<br><br>describe the steps one should take in shopping for a house.<br><br>find the amount of the down payment and the monthly mortgage payment.<br><br>compute the amount of interest on a mortgage loan.<br><br>describe the insurance coverage available to home owners.<br><br>compute the insurance for valuables in a home.<br><br>find the replacement cost of a home.<br><br>have an understanding of assessed valuation and property taxes.<br><br>compare costs of buying a home with costs of building a home. |

(cont.)



(cont.)

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Cabinet Installation (cont.) | | Students will: | Given the proper instruction, the student should be able to: |
| | | -relate type and size of a home to family needs. | demonstrate an understanding of a W-2 form in regard to federal, state and city tax withheld. |
| | | -have a real estate person come in to discuss advantages and disadvantages of renting or buying a home. | fill out a 1040 or other currently applicable income tax return. |
| | | -fill out actual income tax forms. | find the amount of medical expenses paid by insurance and the amount the insured pays. |
| | | -take a field trip to the IRS. | compare the kinds of medical insurance available. |
| | | -discuss the major kinds of health insurance. | demonstrate an understanding of the need for and purpose of life insurance. |
| | | -calculate the amount paid by insurance and the amount paid by the patient with various health insurance plans. | compare and compute annual premiums for term, straight life, limited payment life, and endowment insurance. |
| | | -discuss the various kinds of life insurance. | |
| | | -calculate premiums for various life insurance policies. | |
| | | -calculate cash values of various life insurance policies. | |
| | | -complete the following activity under the supervision of the teacher. | |
| | | -use a construction drawing or blueprint to determine the type, size and quantity of cabinets required. (cont.) | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Cabinet Installation (cont.) | | Students will:<br><br>-use a current builder's supply catalog to estimate the cost of the cabinets.<br><br>Films: On Your Own (#3777)<br>Your Own Place (#3778)<br>Taxes: Why We Have Them (#3837)<br>Percent and Percentage: Insurance (#5610)<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| TRIM WORK<br><br>Time Allotment: Days 106-110 | | | |
| Given the proper instruction, the student should be able to: | Students will: | Students will: | Given the proper instruction, the student should be able to: |
| hang a door.<br><br>place window and door casing trim around frames.<br><br>install moldings.<br><br>install a regular door.<br><br>install door tracks for bi-folding, bi-sliding and pocket doors.<br><br>cut and install door casing.<br><br>trim out windows with casings.<br><br>cut and install baseboards, base shoe, and crown moldings.<br><br>install handrails, newel posts. | -hang a door.<br><br>-install door casing.<br><br>-install baseboard, shoe and crown molding.<br><br>-install special door tracks.<br><br>-trim windows.<br><br>-install handrails, newel posts and ballisters.<br><br>Note: Students will complete the objectives of vocational applied mathematics. | -calculate payroll deductions for FICA purposes.<br><br>-discuss and compare Social Security with other retirement plans.<br><br>-calculate Social Security benefits at different retirement ages.<br><br>-complete the following activity under the supervision of the teacher:<br><br>use a construction drawing or blueprint to estimate the quantities of baseboards, molding, and other trim materials needed for the job.<br><br>use a current builder's supply catalog to estimate the cost of trim materials.<br><br>Note: Academic and vocational teachers will coordinate activities. | demonstrate an understanding of the Social Security System.<br><br>compute annual Social Security retirement benefits.<br><br>compute payroll deductions for Social Security.<br><br>compare retirement benefits at different ages. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| SHELVING TECHNIQUES<br><br>Time Allotment: Days 111-115<br><br>Given the proper instruction, the student should be able to:<br><br>install shelf brackets and supports.<br><br>make shelves, secure and install.<br><br>install adjustable shelf supports.<br><br>secure shelf supports and/or brackets.<br><br>prepare plywood shelves.<br><br>cut solid wood shelves.<br><br>install metal shelves and racks.<br><br>install special shelves. | Students will:<br><br>-put up adjustable shelf supports.<br><br>-cut plywood shelves to size.<br><br>-install shelf supports.<br><br>-cut solid wood shelves.<br><br>-install special shelves.<br><br>-take test.<br><br>-attend VICA sessions. | Students will:<br><br>-compare gross income and disposable income.<br><br>-calculate disposable income when given gross pay and deductions.<br><br>-calculate the "average" amount spent for that item or service after having been given the monthly expenditures for a particular service for several months.<br><br>-Complete the following activities under the supervision of the teacher:<br><br>use a construction drawing of shelving and estimate the quantities of lumber and other materials required to install the shelving.<br><br>use a current builder's supply catalog to estimate the cost of materials required for the shelving.<br><br>(cont.) | Given the proper instruction, the student should be able to<br><br>organize monthly records to make a budget.<br><br>understand why it is important to base a budget on disposable income rather than on gross income.<br><br>find the total amount for different categories of a budget.<br><br>calculate disposable income for a year, month, and week when gross pay and deductions are given.<br><br>find the average over several months for items to be budgeted.<br><br>use the average to determine the amount to be budgeted for variable expenses. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Shelving Techniques (cont.) | | Students will:<br><br>Film: It's Your Money (#3183)<br><br>Note: Academic and vocational teachers will coordinate activities. | |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| CLOSET DESIGNS<br><br>Time Allotment: Days 116-120<br><br>Given the proper instruction, the student should be able to:<br><br>build a linen closet, a bedroom closet and a corner closet.<br><br>hang closet doors.<br><br>design linen and bedroom closets.<br><br>build a linen and a bedroom closet.<br><br>design a special corner closet.<br><br>build a corner closet.<br><br>install sliding bi-fold and pocket door tracks.<br><br>hang all 3 types of doors.<br><br>Note: Students will complete the objectives of vocational applied mathematics. | Students will:<br><br>-measure and design a linen closet.<br><br>-design a special corner closet.<br><br>-install sliding, bi-fold and pocket door tracks.<br><br>-build a linen and bedroom closet.<br><br>-install a corner closet.<br><br>-hang a sliding, bi-fold and/or pocket door. | Students will:<br><br>-make a budget for a week, a month and a year.<br><br>-discuss deviations from a budget and the handling of "unexpected" expenses.<br><br>-keep a log or all expenditures (no matter what they are) for 30 days to show where money is really "going."<br><br>-complete the following activity under the supervision of the teacher:<br><br>discuss the relationship between the size of a closet and its capacity in cubic feet.<br><br>calculate the capacity in cubic feet of a closet whose dimensions are known.<br><br>calculate in cubic feet various closet dimensions which would meet the capacity requirements as given.<br><br>Film: Handling Money (#3415)<br><br>Note: Academic and vocational teachers will coordinate activities. | Given the proper instruction, the student should be able to<br><br>complete a budget sheet for a family budget.<br><br>understand the importance of budgeting for savings.<br><br>make a budget using variable and fixed monthly expenses.<br><br>find the amount to be reserved monthly for annual expenses.<br><br>understand the importance of record keeping in planning a realistic budget.<br><br>find the amount to be reserved weekly for monthly expenses.<br><br>adjust a budget to reflect changes in expenses or income.<br><br>make decisions based on the adjusted budget. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| STAIR CONSTRUCTION<br><br>Time Allotment: Days 121-135<br><br>Given the proper instruction, the student should be able to:<br><br>calculate stair construction problems, needed headroom above the treads.<br>layout and cut stringers.<br>learn termonology.<br>learn parts of stairs.<br>design stairs for the job.<br>figure tread and riser sizes.<br>determine headroom size to code<br>analyze installation problems.<br>use framing square to lay out stringers.<br>frame up a stair landing.<br>assemble treads and risers.<br>cut stringers to lay out.<br>lay out and frame a set of cleat stairs.<br>frame up stringers, treads and risers.<br>install ledger strips.<br><br>(cont.) | Students will:<br><br>-remember stair terms and parts<br>-use framing square for stair layout.<br>-frame up stair unit.<br>-plan for the right stairs.<br>-frame up stair landing.<br>-nail up ledger strips.<br>-figure tread and riser sizes.<br>-assemble treads and risers.<br>-erect stairs to header.<br>-calculate headroom above treads.<br>-cut stairways.<br>-anchor stairs to low end.<br>-determine installation methods.<br>-frame cleat stair system.<br>-install folding stairs.<br>-take exam.<br>-attend VICA session. | Students will:<br><br>-calculate the "unit" price of food items.<br>-use newspaper ads to compare prices and determine the best price for specific food items.<br>-compare costs of generic and nationally advertised food items.<br>-choose a construction tool to be purchased, then calculate the amount of discount and sale price if that tool is put on sale at various discounts, (10%, 20%, 25%, 40%, etc.).<br>-complete the following activity under the supervision of the teacher:<br>use construction drawings or blueprints to determint the "rise" and "run" of various stairs shown.<br>discuss tread and riser dimensions as related to "rise" and "run.".<br><br>(cont.) | Given the proper instruction, the student should be able to<br><br>compute the unit cost of a grocery item.<br>compare the costs of two different brands or sizes.<br>describe some consumer shopping mistakes and how to avoid them.<br>convert units of measure.<br>compare prices of nationally advertised and generic brands.<br>understand the reasons items are put on sale.<br>compute the amount of discount and sale price.<br>determine the best month for buying certain items, using a chart. |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Stair Construction (cont.)<br><br>erect stairs to header with hangers.<br><br>anchor stair at lower level.<br><br>install attic folding stairs. | Note: Students will complete the objectives of vocational applied mathematics. | Students will:<br><br>-calculate tread and riser dimensions for a specified "rise" and "run."<br><br>Films: What's In It For Me (#2513)<br>Consumer Complaints: The Right Way (#3182)<br><br>Note: Academic and vocational teachers will coordinate activities. | |

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| JOBSITE WORK<br><br>Time Allotment: Days 136-180<br><br>Students will be required to estimate, layout, and perform what work is necessary to accomplish the job using the materials, proper tools, prepare bills, and communicate with the clients like contractors until the job is completed. Job seeking skills, interviewing techniques and early placement opportunities will be explained.<br><br>Given the proper instruction, the student should be able to:<br><br>estimate and evaluate the job.<br><br>lay out and identify the job requirements.<br><br>review task (module) to be performed.<br><br>complete the job and clean up the site.<br><br>compute, bill and evaluate complete job. | Students will:<br><br>-consider all factors in evaluating job.<br><br>-estimate materials needed.<br><br>-calculate costs involved for the job.<br><br>-learn how to lay out a job.<br><br>-maintain job records.<br><br>-learn profit-making methods.<br><br>-take exam covering the work performed, for this quarter.<br><br>-attend VICA meeting.<br><br>-prepare resumes.<br><br>-prepare questions for interviews.<br><br>-apply for a job. | Students will:<br><br>-complete a catalog order form for various construction items<br><br>-make up a "bill of materials."<br><br>-calculate the total cost of an item you can make yourself.<br><br>-compare "doing-it-yourself" to "buying," considering things other than cost.<br><br>-use rental charts provided by local rental agencies to determine the rental charge for various kinds of construction tools.<br><br>-measure the length and width of the classroom using metric units.<br><br>-measure various pieces of lumber using metric units.<br><br>-use a balance to measure the weight of various everyday items in metric units.<br><br>-use a balance to measure the weight of construction tools and supplies, (nails, screws, hammer, pliers, etc.) in metric units.<br><br>(cont.) | Given the proper instruction, the student should be able to:<br><br>understand reasons for catalog buying.<br><br>complete a catalog order form including total cost.<br><br>compute the total cost of materials for a craft project.<br><br>compare costs of buying or making an item.<br><br>understand the advantages and disadvantages of renting compared to purchasing.<br><br>read a rental chart and compute the cost of renting an item.<br><br>demonstrate an understanding of metric units of linear measurement.<br><br>choose the pertinent linear unit (kilometer, meter, centimeter, millimeter) for a specified application.<br><br>demonstrate an understanding of metric units of mass.<br><br>choose the pertinent unit of mass (kilogram, gram, milligram) for a special application. (cont.) |

APPLIED MATHEMATICS: CARPENTRY II

OBJECTIVES AND ACTIVITIES

| Vocational Student Objectives | Vocational Student Activities | Academic Student Activities | Academic Student Objectives |
|---|---|---|---|
| Jobsite Work (cont.) | | Students will:<br><br>-use empty container (soft-drink, food, etc.) to illustrate metric units of volume.<br><br>-discuss solution, methods and techniques for various problems pertinent to the construction trades.<br><br>-work various word problems pertinent to the construction trades.<br><br>-use calculators to solve basic problems pertinent to the construction trades.<br><br>Films: Expanding Math Skills With a Mini-Calculator<br>-Introduction (#3376)<br>-Classroom Management (#3377)<br>-Problem Solving (3378)<br>Metrics for Measure (#3692)<br>Meter, Liter and Gram (#1160)<br>The Metric System (#3524) | Given the proper instruction, the student should be able to:<br><br>demonstrate an understanding of metric units of volume.<br><br>choose the pertinent unit of volume (liter, milliliter) for a specified application.<br><br>identify the method for solving the problem.<br><br>solve the problem using this method:<br><br>read the problem carefully.<br><br>identify information given and information sought.<br><br>identify relevant information and discard irrelevant information.<br><br>verbalize the problem.<br><br>estimate the answer.<br><br>find the exact answer.<br><br>check.<br><br>demonstrate the ability to use calculators for mathematical computation. |
| | Note: Students will complete the objectives of vocational applied mathematics. | | |



Note: Students will complete the objectives of vocational applied mathematics.

# APPENDIX

FORM A A-1
OPTIONAL

STUDENT PROFILE

Name of Student _____

Homeroom _____

Vocational Program _____ _____

Vocational Teacher _____

Address of Student _____

_____

Phone _____

Name of parent or guardian _____

Number where parent or guardian can be reached during the day _____

Name of support persons outside school environment and Phone Number (if applicable)

_____

Date entered vocational program _____

Date completed program _____

Days absent --Quarter 1_____Quarter 2_____Quarter 3_____Quarter 4_____

Quarter 5_____Quarter 6_____Quarter 7_____Quarter 8_____

Reading score -- entry to program _____exit _____ test used _____

English score -- entry to program _____exit _____ test used _____

Mathematics score -- entry to program _____ exit _____ test used _____

Marks in Vocational Program Quarter 1 Quarter 2 Quarter 3 Quarter 4

_____ _____ _____ _____

Quarter 5 Quarter 6 Quarter 7 Quarter 8

_____ _____ _____ _____

Marks in other courses

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Course _____Quarter 1___Quarter 2___Quarter 3___Quarter 4___

Applied Academics - English and Mathematics

Parts I, II, IV, and V of this form are to be completed by the vocational teacher who will then give copies of this form to the reading and mathematics teachers before the unit is taught. The reading teacher completes Part III. Only one form is needed per unit regardless of the number of students involved.

Names of students _____

_____

_____

_____

Vocational Program Unit _____

I. Vocabulary

Technical _____

_____

_____

_____

Non-Technical _____

_____

_____

_____

II. Assigned reading _____ pages _____

III. Reading Skills/ English Skills _____

_____

_____

_____

IV. Types of writing involved in this unit

_____

_____

_____

_____

V. Mathematics involved in this unit

_____

_____

_____

_____

VI. Special Considerations:

FORM C - 1

A-3

## GROUP WORK RATING FORM, VOCATIONAL CLASS

4 - Always  3 - Most of the Time  2 - Sometimes  1 - Never

| TASK | Term 1 | Term 2 | Term 3 | Term 4 | |
|---|---|---|---|---|---|
| finishes study guide (or other work) independently before joining group | | | | | |
| has necessary materials (guide, book, pencil, etc.) | | | | | |
| sticks to the subject | | | | | |
| participates in group discussion by asking the opinions of others | | | | | |
| listens when other group members are talking | | | | | |
| is courteous to other group members - avoids personal attacks | | | | | |
| willingly helps other group members | | | | | |
| uses time wisely | | | | | |
| follows directions carefully | | | | | |

Total Score: _____  Teacher _____

M. Lynne Smith, Content Reading Manual
Cincinnati City Schools

# TEACHER'S EVALUATION OF STUDENT - AFFECTIVE DOMAIN

Name of Student _____

Name of evaluating teacher _____

Date _____ Term _____

Applied Academics teachers are to evaluate stuents in the following categories at the end of each term. The rating is to be written in the blank space in the "Rating" column.

| | Excellent 5 | 4 | 3 | 2 | Poor 1 | Rating |
|---|---|---|---|---|---|---|
| 1. Follows directions | | | | | | _____ |
| 2. Takes responsibility | | | | | | _____ |
| 3. Cooperates with peers | | | | | | _____ |
| 4. Responds positively to criticism | | | | | | _____ |
| 5. Cooperates with superiors | | | | | | _____ |
| 6. Takes the initiative | | | | | | _____ |
| 7. Manages time well | | | | | | _____ |
| 8. Persists until task is accomplished | | | | | | _____ |
| 9. Is open to new ideas | | | | | | _____ |
| 10. Is organized | | | | | | _____ |

Note: During the term, conference teachers will discuss their ratings and come to a consensus on each one. The score recorded on the Applied Academics Evaluation Form is an average rating, that is, the consensus ratings are added and the total is divided by ten. (number of item)

# ESTES ATTITUDE SCALE

Date _____ Name _____

Directions: Respond to each item below in terms of A (strongly agree), B (agree), C (undecided), D (disagree), or E (strongly disagree). The scale is repeated here.

Circle the letter indicating your feeling.

A - Strongly Agree B -Agree
C - Undecided D -Disagree
E - Strongly Disagree

A B C D E 1. Reading is for learning but not for enjoyment.

A B C D E 2. Money spent on books is well spent.

A B C D E 3. There is nothing to be gained from reading books.

A B C D E 4. Books are a bore.

A B C D E 5. Reading is a good way to spend spare time.

A B C D E 6. Sharing books in class is a waste of time.

A B C D E 7. Reading turns me on.

A B C D E 8. Reading is only for grade grabbers.

A B C D E 9. Books aren't usually good enough to finish.

A B C D E 10. Reading is rewarding to me.

A B C D E 11. Reading becomes boring after about an hour.

A B C D E 12. Most books are too long and dull.

A B C D E 13. Free reading doesn't teach anything.

A B C D E 14. There should be more time for free reading during the school day.

A B C D E 15. There are many books which I hope to read.

A B C D E 16. Books should not be read except for class requirements.

A B C D E 17. Reading is something I can do without.

A B C D E 18. A certain amount of summer vacation should be set aside for reading.

A B C D E 19. Books make good presents.

A B C D E 20. Reading is dull.

SCORING DATE_____

Positive items: Nos. 2, 5, 7, 10, 14, 15, 18, 19
Negative items: Nos. 1, 3, 4, 6, 8, 9, 11, 12, 13, 16, 17, 20

Check the response values for the answers. Record them on the answer sheet.
If "C" was marked for #1, the score would be 3; "A" for #2 would be a score of 5, etc.
Then total the score.

| | | A | B | C | D | E |
|---|---|---|---|---|---|---|
| A B C D E | 1. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 2. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 3. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 4. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 5. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 6. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 7. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 8. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 9. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 10. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 11. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 12. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 13. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 14. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 15. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 16. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 17. | 1 | 2 | 3 | 4 | 5 |
| A B C D E | 18. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 19. | 5 | 4 | 3 | 2 | 1 |
| A B C D E | 20. | 1 | 2 | 3 | 4 | 5 |

# SANDERS ATTITUDE SCALE

A means "I strongly agree"
B means "I agree"
C means "I'm undecided"
D means "I disagree"
E means "I strongly disagree"

| | | A | B | C | D | E |
|---|---|---|---|---|---|---|
| 1. | Teachers expect their students to fail. | | | | | |
| 2. | Teachers respect their students' opinions. | | | | | |
| 3. | Teachers don't understand what their students need | | | | | |
| 4. | Teachers are good listeners. | | | | | |
| 5. | Grades show how much a student has really learned. | | | | | |
| 6. | Students' answers are usually wrong. | | | | | |
| 7. | Teachers encourage students to share ideas with each other | | | | | |
| 8. | Students must accept their teachers' opinions | | | | | |
| 9. | Teachers help their students to succeed. | | | | | |
| 10. | Class discussions are a waste of time. | | | | | |
| 11. | It is okay to be wrong. | | | | | |
| 12. | Most tests are unfair. | | | | | |
| 13. | Teachers want to know what their students believe | | | | | |
| 14. | It is difficult to succeed in school. | | | | | |
| 15. | Teachers encourage students to think for themselves. | | | | | |

# SANDERS ATTITUDE SCALE

## Scoring

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1. | 1 | 2 | 3 | 4 | 5 |
| 2. | 5 | 4 | 3 | 2 | 1 |
| 3. | 1 | 2 | 3 | 4 | 5 |
| 4. | 5 | 4 | 3 | 2 | 1 |
| 5. | 5 | 4 | 3 | 2 | 1 |
| 6. | 1 | 2 | 3 | 4 | 5 |
| 7. | 5 | 4 | 3 | 2 | 1 |
| 8. | 1 | 2 | 3 | 4 | 5 |
| 9. | 5 | 4 | 3 | 2 | 1 |
| 10. | 1 | 2 | 3 | 4 | 5 |
| 11. | 5 | 4 | 3 | 2 | 1 |
| 12. | 1 | 2 | 3 | 4 | 5 |
| 13. | 5 | 4 | 3 | 2 | 1 |
| 14. | 1 | 2 | 3 | 4 | 5 |
| 15. | 5 | 4 | 3 | 2 | 1 |

Total Score: _____

Mean Score: _____

The Sanders Attitude Scale is reprinted by permission of the author, Peter L.Sanders.

APPLIED ACADEMICS

EVALUATION FORM

1. Student's Name _____

2. Vocational Program _____ School _____

3. Standardized reading scores

   Stanford Test of Academic Skills - Level 1

   Composite score -- Pre _____ date _____

   Post _____ date _____

   Change _____ date _____

4. Standardized English scores

   Stanford Test of Academic Skills - Level 1

   Composite score -- Pre _____ date _____

   Post _____ date _____

   Change _____ date _____

5. Standardized Mathematics scores

   Stanford Test of Academic Skills - Level 1

   Composite score -- Pre _____ date _____

   Post _____ date _____

   Change _____ date _____

6. Writing Sample - Mean T-unit length

7. Term grades in vocational program

| Last Year | | Present Year | |
|---|---|---|---|
| Term 1 | _____ | Term 1 | _____ |
| Term 2 | _____ | Term 2 | _____ |
| Term 3 | _____ | Term 3 | _____ |
| Term 4 | _____ | Term 4 | _____ |

8. Term grades in language or math units

| Last Year | | Present Year | |
|---|---|---|---|
| Term 1 | _____ | Term 1 | _____ |
| Term 2 | _____ | Term 2 | _____ |
| Term 3 | _____ | Term 3 | _____ |
| Term 4 | _____ | Term 4 | _____ |

9. Days absent per term

| Last Year | Present Year |
|---|---|
| Term 1 _____ | Term 1 _____ |
| Term 2 _____ | Term 2 _____ |
| Term 3 _____ | Term 3 _____ |
| Term 4 _____ | Term 4 _____ |

10. Sanders Attitude Scale

Mean score - Pre _____ date _____

Mean score - Post _____date _____

Change _____

11. Estes Attitude Scale (reading)

Mean score - Pre _____ date _____

Mean score - Post _____date _____

Change _____

12. Group Work Rating Form

Scores - Term 1 _____ Term 2 _____Term 3 _____ Term 4 _____

13. Average Rating Form

Evaluation of Student - Affective Domain
(consensus from Vocational and Applied Academics teachers)

Term 1 _____ Term 2 _____ Term 3 _____ Term 4 _____

TASK Retrieval Sheet - Applied Academics Program

Vocational Program _____ Academic Subject _____

Vocational Instructor _____ School _____

Class Period Scheduled _____ Academics Teacher _____

Sub Tests Needed
Communications
English, Vocab. Rdg.
Math
Math & Reading

| NAME | GRADE | STUDENT NUMBER | Sub-Test: | | | | | | | | | | | | Sub-test: | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pre-Test | | | | Post-Test | | | | Change | | | | Pre-Test | | | | Post-Test | | | | Change | | | |
| | | | Raw | % | NCE | G.E | Raw | % | NCE | G.E. | Raw | % | NCE | G.E. | Raw | % | NCE | G.E. | Raw | % | NCE | G.E. | Raw | % | NCE | G.E. |
| 1. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20. | | | | | | | | | | | | | | | | | | | | | | | | | | |

A-12
Form E